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THE ACTION OF QUININE DIHYDROCHLORIDE ON THE INTESTINE *

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Investigations and studies of the action of quinine and its official salts on the intestine had their origin many years ago. In 1897, Hugo Schulz,[1] who administered quinine hydrochloride daily by mouth for one month, reported an increased intestinal activity with a subsequent decrease. In 1909 Schmiedeberg [2] reported that his studies with this drug had demonstrated an increased intestinal peristaltic activity. In 1914 Ladisch,[3] who studied the action of the quinine alkaloids on the smooth musculature of the intestine, reported stimulation following small doses (increase in the size of the contractions and increase of tonus), and paralysis when the drug was used in greater concentration. Ladisch cites the work of Chione, who observed an increased intestinal peristalsis and simultaneously an increase in the size of the intestinal lumen, which continued for a time after death. In 1927 Gustav Singer [4] presented a preliminary report on the action of the double salts of quinine in cases of severe and intractable constipation. He administered the quinine compounds subcutaneously, intravenously and rectally in the form of suppositories and small enemas. The rectal method gave by far the best and most prompt results. In fifty-four out of seventy-two cases the results were positive. The stools were massive and never watery, and manifestations of anorectal irritation were absent in a majority of cases. Singer says: "From these investigations it seems quite probable that quinine and especially its double salts cause a direct stimulating action on the smooth musculature of the intestine, which action is analogous to that on the urinary bladder and the uterus."

In 1928 I instituted in the Indiana University Hospitals a series of studies the object of which was to ascertain the action of quinine dihydrochloride on the large intestine in cases of chronic constipation. These studies also comprised the determination of the time required for this double salt of quinine to act on the large intestine and, if positive results were obtained, to what extent following defecation the contents of the rectum and colon had been evacuated. Associated with me in this work were Drs. L. H. Allen, G. J. Garceau and J. H. Clevenger, chiefs of the resident staffs, and Dr. L. A. Smith, consulting roentgenologist. The required preparations of quinine dihydrochloride were supplied by the chemical control department of Eli Lilly and Company. Animal experimentation was not carried out because of the fact that Ladisch, Chione and others had reported similar results from their studies of the action of quinine on the smooth musculature of rabbits.

The quinine dihydrochloride was administered in the form of suppositories made of oil of theobroma with a low melting point. Suppositories containing 5 grains (0.3 Gm.) of this drug were employed for the therapeutic tests. Enemas containing 25 cc. of a 2 per cent solution of the drug proved as effective as the suppository therapy. Their employment, however, was discontinued in favor of the much easier method of suppository administration.

Accurate records were made as to the time the suppositories were administered, the time when stools occurred, the character of the stools, and any favorable or untoward resulting symptoms. Fluoroscopic studies and roentgenograms were made of barium meals and enemas both before and after the administration of the quinine suppositories, and these studies were continued at intervals of five minutes for one hour. If positive results were obtained, roentgenograms were made immediately following defecation. The purpose of these studies was to ascertain any alterations that might occur in the colonic haustrations and to observe any movement of the barium shadows. These roentgenologic studies were of inestimable value as they determined accurately to what extent the barium contents of the rectum and colon had been evacuated.

The 5-grain (0.3 Gm.) quinine dihydrochloride suppository therapy was employed in every type of case that could be obtained from the clinics in the Indiana University hospitals. The majority of the patients were typical examples of medical and surgical patients confined to their beds as the result of diseases that were conspicuous for their chronicity. In all, 185 patients were studied. Of these, twelve were employees in the hospitals and were apparently normal individuals; 133 were adults and fifty-two were children; seventy were males and 115 were females. The ages varied from 4 to 80 years. The average of the children was 9 years; 66 per cent of the adults were under 40. Seventy-two per cent of these 185 patients gave a history of chronic constipation.

Positive results were obtained in 76.2 per cent of the cases. Of these positive results, 82.8 per cent occurred in males and 71.1 per cent in females. In 80 per cent the stools occurred within one hour, the longest time being ten hours. The stools were large but never watery. In 25 per cent of the cases there were manifestations of anorectal irritation in the form of rectal

* Chairman's address, read before the Section on Gastro-Enterology and Proctology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Schulz, Hugo: Virchows Arch. f. path. Anat., 1897.
2. Schmiedeberg: Grundriss der Pharmakolgie, Leipzig, Vogel, 1909.
3. Ladisch: Greifswald, July, 1914.
4. Singer, Gustav: Wien. klin. Wchnschr., Oct. 6, 1927.

burning and tenesmus. Small rectal hemorrhages occurring with the stools were observed in 2 per cent of the cases. These were the only untoward symptoms manifested.

The accompanying tabulation presents the diagnoses and the results that were obtained with the 5-grain (0.3 Gm.) quinine dihydrochloride suppository therapy in 185 cases.

ROENTGENOLOGIC STUDY OF CASES

The following report of his roentgenologic studies of two cases was made by Dr. L. A. Smith:

CASE 1.—In a woman giving a history of repeated attacks of acute indigestion and of chronic constipation of many years' duration, a diagnosis of cholelithiasis was made. Twenty-four hours following a barium meal, fluoroscopic studies and roentgenograms of the colon showed a moderate amount of barium in the ascending and hepatic portions and also in the descending colon and sigmoid. A 5-grain (0.3 Gm.) quinine dihydrochloride suppository was introduced into the rectum and repeated fluoroscopic studies were made for one hour. Throughout these studies there was an urgent desire on the part of the patient to defecate, and yet no alteration in the haustrations of the colon was detected nor was Dr. Smith fortunate enough to see any movement of the barium shadow.

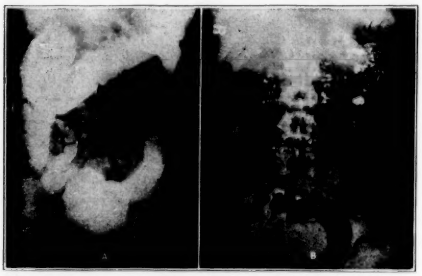

Fig. 1 (case 1).—*A*, colon following administration of a barium enema; *B*, fifteen minutes following the administration of a 5-grain (0.3 Gm.) quinine dihydrochloride suppository. The barium contents of the colon have been fairly well evacuated.

Immediately following these studies, the patient defecated. A roentgenogram was made and showed a partial emptying of the cecum, a moderate amount of barium in the hepatic flexure, traces in the proximal transverse colon, and no barium in the descending colon and sigmoid. The action in this case was moderate in degree. This, however, cannot be regarded as a fair test on account of the fact that only a moderate amount of barium was in the colon at the time the therapeutic test was begun.

CASE 2.—A woman, aged 22, in the hospital for the treatment of a duodenal ulcer, had been accustomed to the use of cathartics every night for the past four years. Examination twenty-four hours after a barium meal had been given showed the colon full in the cecum and the ascending, transverse and descending portions. There was a moderate amount of barium in the sigmoid, and traces of it were present in the rectum. A quinine dihydrochloride suppository was administered and repeated fluoroscopic studies were made for one hour. Although the patient complained of a most urgent desire to defecate, no alteration was observed in the haustrations of the colon, and Dr. Smith failed to observe any movement of the barium shadow. Fifteen minutes later a stool occurred and a roentgenogram was made. This showed almost complete emptying of the colon with the exception of a moderate amount of barium in the cecum and ascending portion. In this case the evacuation of the colon was quite complete, in view of the fact that a barium meal instead of a barium enema was administered.

The quinine suppository therapy effected a much more complete evacuation of the colonic contents following the use of the barium enema than when the barium meal was given. However, no significance was attached to these results because it is quite probable, as has been the experience of all roentgenologists, that the contents of these colons would have been evacuated following the barium enemas without any mechanical or chemical stimulation having been employed.

FURTHER EXPERIMENTAL STUDY

The positive results (76.2 per cent) which were obtained in the 185 cases reported here, and Singer's report of 75 per cent positive results in seventy-two

Diagnosis and Results Obtained with Quinine Dihydrochloride Suppository

Diagnosis	Number of Cases	Positive	Negative
Normal individuals	12	11	1
Acute arthritis	2	2	0
Appendicitis (postoperative)	4	4	0
Asthma (bronchial)	1	1	0
Acute bronchitis	1	1	0
Carcinomatosis	2	2	0
Cholelithiasis (postoperative)	10	10	0
Mucous colitis	6	5	1
Chronic nephritis (interstitial)	5	4	1
Diabetes mellitus	3	2	1
Dermatitis exfoliativa	1	0	1
Duhring's disease	1	1	0
Arthritis deformans	20	15	5
Friedreich's ataxia	3	3	0
Exophthalmic goiter	5	4	1
Psychasthenia	7	5	2
Duodenal ulcer	3	3	0
Hodgkin's disease	2	1	1
Paroxysmal tachycardia	2	0	2
Pelvic disease (postoperative)	4	0	4
Prostatic disease (postoperative)	4	3	1
Septic arthritis	2	0	2
Thrombo-angiitis obliterans (postoperative, amputation)	1	1	0
Rectal cancer (colostomy)	1	0	1
Postoperative herniotomy	3	2	1
Ischiorectal abscess (postoperative)	1	1	0
Empyema	2	2	0
Multiple sclerosis	1	1	0
Parkinson's disease	3	3	0
Fröhlich's disease	1	1	0
Syphilis (tabes dorsalis)	14	7	7
Senility	1	1	0
Toxic adenoma (thyroid)	2	2	0
Hypothyroidism	1	0	1
Pruritus ani	1	1	0
Angina pectoris	1	0	1
Hyperemesis gravidarum	3	1	2
Fracture (femur)	1	1	0
Brain tumor	1	1	0
Malignant prostate	1	0	1
Congenital dislocation (hip)	4	4	0
Postpoliomyelitis	6	5	1
Rickets	2	2	0
Neuritis	2	1	1
Eye (surgical)	2	2	0
Osteomyelitis	5	5	0
Friedreich's disease	4	4	0
Lordosis	4	1	3
Tuberculosis (hip)	2	1	1
Spastic hemiplegia	1	1	0
Fracture (scapula)	1	1	0
Cyst, thyroglossus duct	1	1	0
Ankylosis (shoulder)	1	1	0
Ankylosis (elbow)	1	1	0
Ankylosis (knee)	1	0	1
Unclassified	9	9	0
Total	185	141	44

cases, were seemingly sufficient evidence to warrant the conclusion that they were due solely to some action of the quinine dihydrochloride contained in the suppositories. However, before accepting this conclusion as final it was decided that some further studies were necessary. Forty children in whom the quinine suppository therapy had been employed were selected for these studies or additional therapeutic tests. Plain oil of theobroma suppositories, of the same size and shape as those containing the double salt of quinine, were

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administered. Positive results were obtained in 58 per cent of these cases, as compared with 85 per cent when the quinine therapy was employed. In 86 per cent of these 58 per cent positive results, the stools occurred within one hour. The stools were practically normal and manifestations of anorectal irritation were absent in all of the cases. This 58 per cent of positive results obtained with the employment of the plain oil of theobroma suppositories demonstrated somewhat conclusively that the 85 per cent of positive results obtained with the quinine therapy was not due solely to the action of quinine dihydrochloride.

In 75 per cent of the 185 cases in which the quinine suppositories yielded positive results, the stools, while large, were most satisfactory. In fact, many of these patients requested that the treatment be repeated daily during their stay in the hospital. The 25 per cent in whom anorectal irritations were manifested complained most bitterly of the treatment. However, in a majority of these cases it is quite probable that the same untoward symptoms would have followed the administration of any cathartic or stimulating enema. Fissures, anorectal ulcerations, anorectal fistulas, cryptitis, and large eroded and prolapsing internal piles were diagnosed, and the large stools undoubtedly aggravated these anorectal diseases. It is also possible that the direct action of the quinine dihydrochloride on the anal canal was a causative factor, as these untoward symptoms were not manifested following the administration of the plain oil of theobroma suppositories. Hurst [5] demonstrated that the rectal burning and tenesmus following the employment of glycerin suppositories are not due to the action of the drug on the rectal mucosa. Glycerin applied through a small proctoscope does not produce any sensation. Rectal burning and tenesmus occur only when the glycerin is applied directly to the anal canal at or just below the pectinate line. Hurst [6] says: "It is a question as to whether small quantities of the glycerin escape from the rectum into the anal canal and that the defecation reflex to which it gives rise probably originates in the anal canal." It is also possible that the chemical irritation of the rectum, though it produces no sensation, may give rise to reflex defecation.

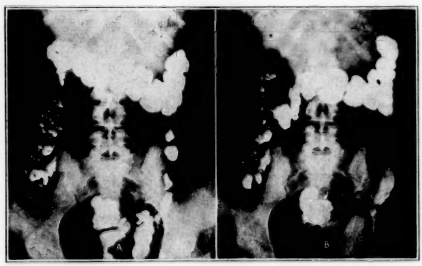

Fig. 2 (case 2).—*A*, twenty-four hours following the administration of a barium meal; *B*, thirty minutes following the administration of the 5-grain (0.3 Gm.) quinine dihydrochloride suppository. The results in this case were not very satisfactory, although the rectum contained no barium.

The defecation reflex, as has been demonstrated by Hurst and others, can be artificially excited not only by digital and instrumental rectal examinations but also by the introduction into the rectum of a chemically indifferent suppository. I have not infrequently observed that the gentle introduction of my little finger or a small proctoscope into the rectum of a child will provoke defecation. In the adult these examinations will occasionally excite or stimulate the defecation reflex, and an urgent desire for stool is evidenced. The defecation reflex, however, is stimulated with more certainty when a chemical irritant comes in direct contact with the anal canal. The nerves supplying the smooth or involuntary musculature of the internal sphincter, rectum and colon have their origin in the ganglion cells of the peripheral nerve supply, and Hurst [7] says: "It is quite possible that these ganglion cells form the center for the reflex defecation when the rectum is distended or irritated."

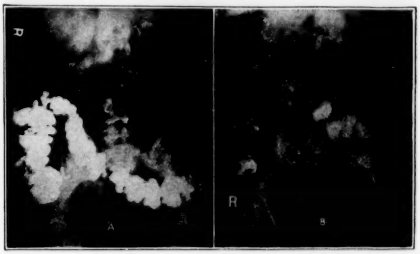

Fig. 3 (case 3).—*A*, twenty-four hours following the administration of a barium meal; *B*, forty minutes following the quinine therapy. There occurred an almost complete evacuation of the barium in the upper colon.

COMMENT

From these investigations and studies of the action of quinine dihydrochloride administered rectally in 185 cases of chronic constipation, it has been demonstrated conclusively, I believe, that the positive results obtained were not due solely to the action of this double salt of quinine. The positive results that were obtained from the employment of chemically indifferent suppositories would indicate a mechanical stimulation of the defecation reflex such as occurs during or following a digital or proctoscopic examination. The rectal mucosa is insensitive to tactile and chemical stimulation. I have

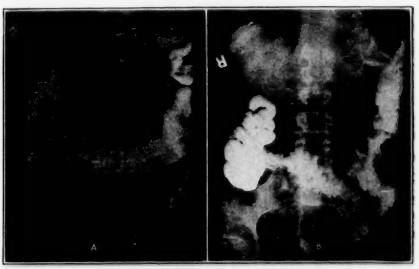

Fig. 4 (case 4).—*A*, twenty-four hours following the administration of a barium meal; *B*, thirty minutes following the quinine therapy; rectum and pelvic colon empty. Some of the barium in the colon was evacuated.

5. Hurst: Constipation and Allied Intestinal Disorders, 1919, p. 39.
6. Hurst: Constipation and Allied Intestinal Disorders, p. 44.
7. Hurst: Constipation and Allied Intestinal Disorders, p. 361.

demonstrated this fact many times. While it is possible that quinine dihydrochloride with its slightly acid reaction could, without producing any sensation, irritate the rectal mucosa and give rise to reflex defecation, it was impossible to give any credence to this theory. Therefore, the only possible chemical stimulation of this double salt of quinine could occur by its coming in direct contact with the anal canal. This would be possible at the time the quinine suppository was being introduced into the rectum, or if, after the suppository had dissolved in the rectum, a small quantity of the drug escaped into the anal canal. I regard this escape of the quinine compound from the rectum into the anal canal as possible but highly improbable. It is the early tendency of any foreign body introduced into the rectum to travel upward.

The mechanical stimulation of the defecation reflex with the quinine dihydrochloride suppository therapy has been demonstrated. A chemical stimulation of this reflex is also possible, but this factor could not be established. It is quite possible that this double salt of quinine, as Singer says and as has been demonstrated by Ladisch and Chione, causes a stimulating action on the smooth musculature of the intestine. The question as to whether this is a direct stimulating action, or one that is indirectly the result of a mechanical stimulation and a possible chemical stimulation, could not be determined. In the majority of cases in which positive results were not obtained with the 5-grain (0.3 Gm.) quinine dihydrochloride therapy, the employment of 10 grains (0.6 Gm.) of the drug proved successful. This might signify that some rectal mucosas required greater chemical stimulation than did others. These theories are problematic, and unfortunately my studies did not enable me to prove them with any degree of certainty.

The results of these studies of the action of quinine dihydrochloride on the intestine in 185 cases of chronic constipation have not been spectacular. However, any therapy which will yield 76.2 per cent positive results is satisfactory and sufficiently convincing as to its value. Further studies with this therapy in cases of uncomplicated constipation, as has been done by Singer, are necessary before the real value of this double salt of quinine can be determined. If a rapid evacuation of the contents of the rectum and pelvic colon is desired, the administration of a 5-grain (0.3 Gm.) quinine dihydrochloride suppository is far preferable to a cathartic or stimulating enema. Better and more prompt results will be obtained, and although the stools will be large they will never be watery, as occurs so frequently following other therapeutic methods employed for evacuating the contents of the rectum and colon.

In the 185 cases studied there was observed only one contraindication to the quinine therapy. This occurred in the patients with painful anorectal diseases. In those with fissures, ulcerations, fistulas, and large eroding and prolapsing internal piles, the symptoms following the employment of the quinine suppository therapy were very distressing. Pregnant women, particularly after the second trimester, should be made an exception in the employment of this therapy. Its value in therapeutic abortion or in the therapeutic induction of labor was not determined. Unfortunately, there was not available any case of postoperative ileus in which the quinine therapy could be employed. This therapy, however, was of particular value in postoperative cases when cathartics were not tolerated well by mouth and when oral therapy was not desired.

These studies of the action of quinine dihydrochloride on the intestine in cases of chronic constipation proved most interesting, and the positive results of 76.2 per cent obtained with the employment of this drug in 185 cases have demonstrated conclusively that it is a valuable form of treatment when a speedy evacuation of the contents of the rectum and colon is desired.

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THE PROTECTIVE VALUE OF CERTAIN SPECIAL TYPES OF SPECTACLE GLASS *

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Before the materials and appliances proposed for protecting the eyeball and its appendages are considered, the real need for such protection should be made manifest. The ophthalmologist who serves an extensive industrial practice is reminded every day of its necessity and should see to it that both employer and worker are informed concerning the eye hazards of their particular industry and are thoroughly familiar with modern methods of prevention and protection. He can do much to insure safety measures and thereby reduce ocular trauma to a minimum.

However, the ophthalmologist with the average clinical practice also has a responsibility to his clientele, to the extent at least that all who need special protection should be told of their danger and of the means available for securing relative safety.

It is generally conceded that at least 90 per cent of all eye injuries due to external violence would be prevented by the use of properly fitted spectacles or goggles. So long as a person has two useful eyes he may feel justified in taking a chance, but if he has only one or is engaged in an occupation in which the eyes especially are exposed to injury, he has no personal or economic right to neglect the form of ocular protection best suited to his needs.

All too frequently a patient with one eye, on being asked why he is not wearing protecting glasses, will answer that he has been examined by a reputable ophthalmologist who stated that "as the functioning eye was practically normal, glasses need not be worn"—a statement that should be regarded as little less than criminal. Parents are often told that the child with a blind or amblyopic eye is better off without glasses, at least until he begins to use his eyes for school work. An ophthalmologist of international standing has made the statement that innumerable eyes would be saved if all children were fitted with glasses as soon as they began to creep and wore them constantly the rest of their lives. If this may be said of children in general, how much more does it apply to the child who has only one useful eye?

Previous to the last decade, the large majority of ocular casualties came from employees in shops, factories and the railroad service. However, in the last few years, as a result of the extensive safety-first programs, guarded machines and the compulsory use of

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spectacles and goggles, ocular trauma among this group of patients has been greatly reduced. One corporation (American Smelting and Refining Company) employing locally about 600 men has reduced the number of eye injuries from about twenty cases a year to only one, and this one occurred because the workman had temporarily removed his goggles. This organization also carries on a definite educational program, one phase of which is to demonstrate the value of ocular protection to both superintendents and workmen.

Fig. 1.—Goggles fitted with tempered glass. Lenses broken, without ocular injury. Type of goggle mounting found most efficient by American Smelting and Refining Company, Omaha.

As a result of these efforts there are relatively few cases of ocular trauma in larger corporations where safety measures are regularly enforced. Small machine shops, garages and foundries supply more cases than they should, but by far the greater number are in children, farmers, housewives, merchants and carpenters, with a few golfers thrown in for good measure.

In a check-up of fifty patients with ocular trauma seen in the last few months, it was found that sixteen were under 20 years of age, fourteen of them being infants and school children; forty-two were males, and eight females; there were five mechanics, nine farmers, ten laborers and three housewives. In the remainder the occupation was not stated. Three were injured by BB shot from air rifles, three by pieces of flying wood, six by flying glass, two by bird shot, and two by "22 rifle" bullets, with explosions, sling shots, snow balls, hand balls, wire, knives, hedgethorns, cornstalks, flying nails and tin each accounting for one or more injuries. One slight injury was due to a broken spectacle lens, but as far as was shown by the records, lenses were not worn at the time the other forty-nine were injured. With the possible exception of the hunting injuries, all would have been prevented or greatly reduced in severity by a suitable type of protective lens.

The question may be asked, "Do spectacles furnish adequate ocular protection?" There can be no argument about the protective value of a properly fitted goggle. Figure 1 shows several pair of goggles recently collected at the American Smelting and Refining Company, Omaha, each of which saved the vision of one or both eyes of the wearer. However, figure 2 is just as convincing. A young man watching a mechanic fix a car was struck in the left eye by a piece of steel. The steel was removed, but the vision was reduced to 20/70. At first he positively refused to wear a protecting glass as his other eye was practically normal, but later he consented to do so. Within two months he returned with the lens over the normal eye shattered by a piece of steel which would undoubtedly have destroyed the eye but for the protection afforded by the lens. Even if the foreign body penetrates the glass, time is given for closing the lids and the momentum of the missile is so reduced that slight or no injury results.

The objection frequently raised to protecting glasses and, in fact, to any kind of glass, particularly by parents of small children, is that if the patient should fall and break the glass or if the glass should be broken in any way while being worn, the fragments might cause serious injury to the eye. This is a valid objection, as indicated by the occasional reports of ocular injury from broken spectacle lenses. That they are exceedingly rare is admitted, and any ophthalmologist of experience can testify that for every eye injured by a broken lens, literally thousands are protected from injury by their use.

However, it was with the thought of the occasional eye injured by broken splinters of spectacle glass that the following observations and tests were made. I am indebted to Mr. E. Schack, superintendent of safety, American Smelting and Refining Company, Omaha; Mr. W. E. Carlson, manager of the Riggs Optical Company, Omaha, and Theodore Hamblin and Company, Ltd., London, for valuable advice and assistance.

My attention was first called to special resistance glass by the goggle lens used by the air forces during the last war. These were of laminated glass but were not suitable for prescription grinding. Friedenwald [1] called the attention of the profession to a product known as "resistal glass." He had learned of this a few years before through Bowen and King of Baltimore. In a personal communication recently received, he says: "My experience with nonshatterable spectacle glass has been most satisfactory. I have prescribed it in all cases of little children for a good many years and have never had cause to regret it. It retains its transparency but becomes amber in color. I have never found the latter change objectionable."

Four different groups of lenses suitable for prescription grinding were tested for resistance to impact. They are distributed under the trade names of "(1) dreadnaught, (2) super-armour plate, (3) laminated and (4) splintanil." Grades 1 and 2 were of so-called tempered glass; grades 3 and 4 consisted of two sheets of optical glass held together by a transparent binder, the so-called splinter-proof or shatter-proof glass.

The tests consisted of (*a*) a five-eighths inch steel ball bearing weighing 262 grains (15 Gm.) dropped onto the lens from various heights; (*b*) number six chilled shot driven by 3¼ drachms of smokeless powder fired from a 12 gage shotgun at distances of from 25 to 50 yards; (*c*) slugs from a high powered air rifle fired at from 5 to 12 yards, and (*d*) a golf ball thrown forcefully against the lens at a distance of a few feet. In addition to this specimen 4 was exposed to sunlight

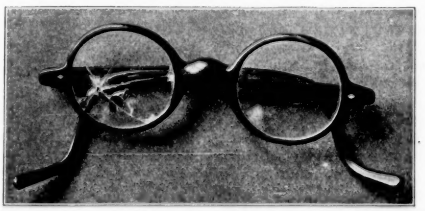

Fig. 2.—Patient lost left eye after intra-ocular injury caused by a piece of steel. He was finally induced to wear protecting glass. He returned in four weeks with the lens over the right eye (good eye) shattered by flying steel which would undoubtedly have destroyed the eye but for the protecting spectacle glass.

1. Friedenwald, Harry: Am. J. Ophth. **7**: 702 (Sept.) 1924.

and mercury vapor light and then tested for changes of transparency in the binding substance.

As far as could be determined, there was little difference in the average resistance of groups 1 and 2, although there was considerable variation in individual specimens of each and in mounted and unmounted lenses. The lenses were placed on strips of carpet padded with "ozite" to approximate the cushioned effect of the lens mounted in the frame and worn by the patient. The steel ball was dropped vertically as nearly as possible on the center of the lens. Some specimens were broken when the ball was dropped from the height of 3 or 4 feet, while others were not affected by a drop of 8 feet.

Groups 3 and 4 were cracked when the ball was dropped from a height of from 4 to 6 feet, but the fragments were held together by the laminating substance. One specimen of number 3 was finally broken in two by repeated blows with a hammer, but even then the fragments were not splintered off (fig. 3 *f*). In the shot test the lenses were mounted on rubber rings one-eighth inch thick and supported on a vertical standard. At 25 yards groups 1 and 2 were shattered into small fragments. Group 3 was shattered but was not perforated. At 50 yards no lens was struck by more than one shot, and there was no injury to any type of lens, indicating that at this distance either type of lens would afford ample protection for hunters or those exposed to their line of fire.

In the air rifle test, sufficient force was used to bury a lead slug weighing 16½ grains (1.07 Gm.) in a soft pine board at a distance of 10 yards. Groups 1 and 2 were shattered into small fragments at 12 yards. Group 3 was shattered, with some glass thrown off the anterior surface and the posterior surface bent in at the point of impact, but no glass was thrown off (fig. 3 *e*).

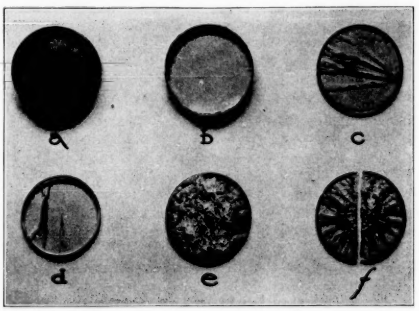

Fig. 3.—*a*, unpolished blank; *b*, polished blank; *c*, blank ground plano for use in goggles; cracked by steel ball from a height of 6 feet; *d*, spectacle lens, +4.00 D; proximal surface cracked by ball from 4 feet. Later both surfaces were cracked by ball from 5 feet. *e*, goggle lens struck by slug from high powered air rifle at 10 yards distance; anterior surface cracked and broken; posterior surface cracked but not separated from binder. *f*, goggle lens pounded vigorously with hammer; finally broken in two by hand.

In the golf ball tests some specimens of groups 1 and 2 were shattered to fragments, although one specimen was not cracked by three direct hits. Groups 3 and 4 were cracked but no glass was thrown off.

These tests showed conclusively that the tempered glass has a higher resistance to direct force, in some specimens twice that of the laminated type, but when the breaking point was reached the tempered glass shattered into very numerous sharp spicule-like fragments. Shattered fragments of types 3 and 4 were usually irregular in shape and very rarely were loosened from the posterior surface of the lens, thus furnishing a much higher type of protection.

The finished lens of the two groups has the common fault of being slightly thicker than the ordinary optical lens. Furthermore, the laminating substance has a tendency to become slightly discolored after considerable exposure to light. The distributors of group 4 state that this has been overcome in their product. To test this, half the surface of the two blanks was covered with opaque paper and then mounted on the surface of a mirror and exposed to the sun for thirty days. The transparency of the exposed portion of the lens was not reduced, but a slight tint about equal to the light shade of the so-called soft-lite was perceptible. There was no loosening of the glass from the binding substance. Another blank, protected in the same way, was exposed to the mercury vapor lamp (Kromayer) for about two and one-half hours. No change was evident in the transparency of the binding substance, but the time of exposure was too short to be of conclusive value.

In some specimens of 3 and 4 there are fine almost invisible specks which do not reduce the visibility but which should be pointed out to the patient when he gets his glasses, as otherwise he will think the lens is imperfect and may be dissatisfied. These types of lenses are of necessity somewhat more expensive than the ordinary lens, and for a patient of limited circumstances need be prescribed only for the good eye, with a lens of ordinary optical glass placed over the blind one.

Much has been written concerning ocular protection from glare. Of the many types of tinted glass sold under various trade names, most or perhaps all of them furnish relief by reducing the intensity of light rather than through any special selective filtering action.

In prescribing lenses for the protection of workmen in welding and cutting operations, a specific tint or color is not as important as is the light excluding quality of the glass. With the extensive use of various types of therapeutic lamps, often by those who are entirely ignorant of the action of the light produced, the ophthalmologists are seeing an increasing number of patients who are usually greatly alarmed by rather sudden severe pain in both eyes with blurred vision, photophobia, and swollen and watery lids. Inquiry reveals the giving or receiving of some sort of light treatment in the last six or eight hours with no or incomplete ocular protection. Both the profession and the laity should be frequently warned of this danger, and the necessity for suitable protection should be emphasized.

No matter how carefully one selects the protecting glass, explains its importance to the patient or urges him to wear it constantly for the sake of protecting perhaps an only eye, unless the lens is mounted in a satisfactory and comfortable frame adapted to the occupational needs of the patient, it will not be worn. Fairly rigid but attractive frames should be prescribed for children (parents will more readily consent if the frames are not unsightly), and light or heavy metal or shell frames according to occupational or esthetic needs for the adult patients; if goggles are to be worn, they should be as light in weight as is consistent with protection, sanitary, not inflammable, easy to put off and

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on, and so adjusted to the shape of the patient's face that they will be comfortable.

CONCLUSIONS

1. It is evident that a laminated glass affords the maximum of ocular protection.

2. When glasses are prescribed for younger children or for persons engaged in occupations with a high eye hazard and for all persons with but one useful eye, no matter what the age or occupation, it is advisable that this type should be prescribed. However, the tempered glass is much superior in protective value to ordinary optical glass and except for its tendency to splinter into sharp fragments is very acceptable.

3. In spite of the fact that the laminating substance now in use is not absolutely free from slight imperfection, the high degree of protection afforded more than makes up for this defect. A decided improvement in the quality of the laminating substance is noticeable, and it is likely that a perfectly satisfactory binder will soon be produced.

4. No matter what type of lens is selected, it must be mounted in a comfortable, good-looking frame, if constant wear is to be expected.

ABSTRACT OF DISCUSSION

DR. RALPH A. FENTON, Portland, Ore.: Dr. Patton's experimental evidence of the value of "triplex" glass in spectacles suggests the use of such glass not only for children and for artisans exposed to ocular trauma, but also for tourists, alpine climbers, and others who may risk accident in automobile or air travel. It is a question, of course, whether such glass would withstand the impact of heavy metal framework or of large, sharp pieces of thick plate glass from the windshield during an automobile accident.

A question occurs respecting the action of molten metal spattering on this cemented glass: Is the intermediate lamina of inflammable cellulose? It is of course likely that babbitt metal or solder would cool so rapidly on striking the outer surface that no danger would be done. Industrial nurses and others charged with the distribution of protective goggles to workmen should receive instruction in adjustment. Not a little of the workman's dissatisfaction with such devices is due to the discomfort to his nose and ears from poorly fitting bridge and temples.

Does Dr. Patton wish us to place this laminated glass, necessarily thick and slightly tinted, before the eyes of all persons with monocular amblyopia, or of those who have lost one eye? This would seem a trifle extreme, for we are clinically aware that such persons acquire a degree of caution in their daily activities. With modern frames and comfortable adjustment, and the avoidance of rimless lenses, such people in ordinary walks of life, even in childhood, rarely break their glasses, and excessively rare are the lenses broken while before the eyes.

DR. E. N. ROBERTSON, Concordia, Kan.: I have known for a long time that it is a good thing to wear glasses to protect the eyes from foreign bodies as advocated by Dr. Patton. Very early in my practice a school teacher came in with the statement that she was chastising a boy, who picked up an inkstand and threw it at her, breaking one of her lenses and cutting her eyelid, but her eyeball was uninjured. This was an object lesson to me of the protective value of lenses. For many years it has been my habit to attend these medical meetings and sometimes travel half way across the continent. A number of times on the train I have had the opportunity to pick foreign bodies out of eyes. I cannot remember ever doing it for an individual who wore glasses.

DR. WALTER B. LANCASTER, Boston: I should like to ask Dr. Patton whether he is recommending a proprietary.

DR. JAMES M. PATTON, Omaha: I do not know what that binder is made of.

DR. LANCASTER: Do you care?

DR. PATTON: Of course I would like to know, but I will take it on faith. As to the question of heavy impact that Dr. Fenton mentions, I do not believe that anything that will not cause serious general injury will break the laminated glass. With regard to its inflammability, the edge of the lens is usually protected with cement, but even if not, I think the possibility of such an accident is slight.

I am not advocating that it should be prescribed in all cases but I do urge most earnestly that any one who has only one useful eye should wear some form of spectacle, and that the person who wants maximum protection should have some form of this special glass. It is surprising how many patients will insist on having it. The complete protection appeals to them and the very slight imperfections in the binder and its tendency to become slightly discolored do not make any real difference.

SOME ASPECTS OF CARBOHYDRATE METABOLISM IN HEPATIC DISEASE *

I. S. RAVDIN, M.D.
PHILADELPHIA

The intravenous injection of dextrose as a preoperative and postoperative measure in poor surgical risks presenting lesions of the biliary apparatus is now so universal that it would seem worth while to consider what we are attempting to do when we administer carbohydrates in these cases. What evidence is there that indicates the existence of a perversion or deficiency of carbohydrate metabolism? In many clinics the administration of dextrose is merely a routine procedure and little thought is given to the object to be attained by its use. Well known physiologic facts concerning the rate of utilization, the effect of dehydration on the ability of the liver to store glycogen, and whether or not insulin should be used in conjunction with dextrose are not given the thought which they require if satisfactory therapeutic effects are to be obtained. At the present time data are not available as to whether or not in the presence of complete obstruction of the common duct glycogen can be synthesized and deposited in the liver and, if so, in what amounts. If it can be deposited, can this be done more readily by the intravenous injection of dextrose or can it be as easily attained by the ingestion of a high carbohydrate diet? These and numerous other questions of considerable interest to the surgeon await solution in the experimental laboratory.

The administration of dextrose intravenously to patients suffering from prolonged obstruction of the bile passages was suggested by Schreiber [1] in 1913, and by Kehr [2] in 1914. Its widespread use in this country, however, began after its advocacy by Crile and Walters four or five years later. From the surgical point of view the rationale of this procedure has not received the attention it demands.

One of the major functions of the liver is its ability to store carbohydrates in the form of glycogen and, from this store, to supply the blood with sugar. Indeed, if the work of Simpson and Macleod [3] and of

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* Read before the Section on Surgery, General and Abdominal, at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

1. Schreiber, E.: Centralbl. f. Chir. **2**: 1200, 1913.
2. Kehr, Hans: Ergebn. d. Chir. u. Orthop. **8**: 471, 1914.
3. Simpson, W. W., and Macleod, J. J. R.: J. Physiol. **64**: 255 (Dec.) 1927.

Choi [4] can be accepted, the liver glycogen is the only source of the blood sugar, since muscle glycogen is converted after mobilization into lactic acid and the latter must then be synthesized into liver glycogen before it can supply the blood with sugar.

As with all the organs that have a large tissue reserve, it is necessary for a considerable amount of liver injury to take place before alterations of the functions are grossly manifest. An obstruction of the common duct produces back pressure on the liver parenchyma and leads to parenchymal injury (figs. 1 and 2). Such injury, after a variable period of time, is reflected in impairment of one or more of the hepatic functions.

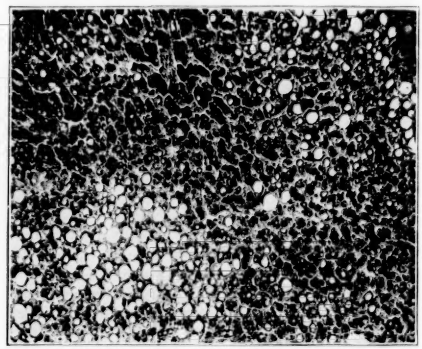

Fig. 1.—Section of liver from a patient suffering from an obstruction of the common duct due to stone; reduced from a photomicrograph with a magnification of 183 diameters.

GLYCOGEN IN THE INJURED LIVER

Géza Hetényi,[5] in 1922, showed that the oral administration of 100 Gm. of dextrose gave a typical blood sugar curve in the normal patient. In various liver diseases this rise was much higher and more prolonged. This was true for both dextrose and levulose given orally or intravenously. The fasting blood sugar was within normal limits, although, in certain diseases of the biliary tract, Hetényi found a low normal and in others a high normal blood sugar. This work has been confirmed by numerous observers. Ferguson,[6] in our laboratory, working with dogs after experimental ligation of the common duct and cholecystectomy, confirmed Hetényi's observations. Figure 3 is a curve obtained by Ferguson in the normal and the jaundiced dog during a dextrose tolerance test. This indicates an insufficiency of the glycogen-building function of the liver in obstructive jaundice. Hetényi found this insufficiency to exist for levulose as well as for dextrose. Although the levulose curve was not as prolonged, this can be explained by a more rapid spilling over of the levulose in the urine. Hetényi believed that the liver could synthesize glycogen but could not store it, but he presented no proof for this assertion. Recently, Friedenson, Rosenbaum, Thalheimer and Peters,[7] in a study of cutaneous and venous blood sugar values in individuals with liver disease, found that the ingestion of dextrose caused a much greater and more prolonged rise in blood sugar in both arterial and venous blood. There is no question that the injured liver can synthesize and store glycogen. The extent to which these processes can be carried on is proportional to the existing injury. When one suffers, the other apparently does to the same degree. We have found no evidence that synthesis may continue when storage is no longer possible. Nor have we found an increase in muscle glycogen accompanying a decrease in the liver glycogen in obstructive jaundice in the rat.

Brill and Fitz-Hugh [8] have done some interesting work on this subject. Studying patients with varying degrees of hepatic injury, they found that epinephrine was unable to mobilize glycogen, as reflected by a rise in the blood sugar, when extensive hepatic injury existed (fig. 4). In such patients one would expect a low glycogen reserve, and Brill and Fitz-Hugh's observations find confirmation in the work of Markowitz [9] and of Olmsted and Coulthard,[10] who concluded that the blood sugar response to epinephrine depended on the presence of adequate amounts of glycogen in the liver. In the moderately injured liver, the rise was not as high as that obtained in the normal, but the curve was not as flat as that in the severely injured liver. Kugelmann,[11] in a similar study published since Brill and Fitz-Hugh did their work in our laboratory, has confirmed these observations. Although Kugelmann suggested the use of this procedure as a test for diagnostic purposes, Brill and Fitz-Hugh believe that it is of no use in the borderline case. It would seem that in those patients having moderate or severe hepatic disease there is insufficient liver glycogen for mobilization. In the dog, Brill and Fitz-Hugh did not obtain the flat curve as frequently after common duct ligation and cholecystectomy as in the patients with advanced liver disease. The curve was of an intermediate type. In them, therefore, it would seem that

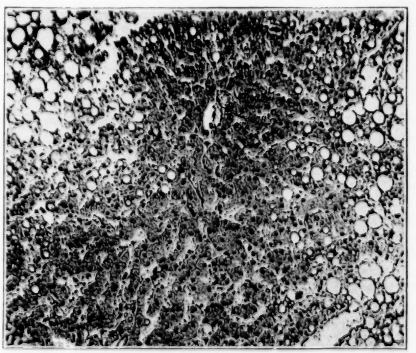

Fig. 2.—Section of liver from a patient suffering from an obstruction of the common duct due to stone; reduced from a photomicrograph with a magnification of 183 diameters.

4. Choi, Y. O.: Am. J. Physiol. **83**: 406 (Jan.) 1928.
5. Hetényi, Géza: Deutsche med. Wchnschr. **48**: 420 (March 31), 770 (June 9), 1200 (Sept. 8) 1922.
6. Ferguson, L. K.: S. Clin. North America **8**: 861 (Aug.) 1928.
7. Friedenson, M.; Rosenbaum, M. K.; Thalheimer, E. J., and Peters, J. P.: J. Biol. Chem. **80**: 269 (Nov.) 1928.
8. Brill, Selling; and Fitz-Hugh, Thomas, Jr.: Epinephrine Glycogenolysis as a Test for Liver Function, Arch. Path. **5**: 1148 (June) 1928. Brill, Selling: Glycogenolysis Due to Epinephrine in Hepatic Disease, Arch. Surg. **18**: 1803 (April) 1929.
9. Markowitz, J.: Am. J. Physiol. **74**: 22 (Sept.) 1925.
10. Olmsted, J. M. D., and Coulthard, H. S.: Am. J. Physiol. **83**: 513 (Jan.) 1928.
11. Kugelmann, B.: Klin. Wchnschr. **8**: 264, 1929.

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some glycogen is stored long after the production of experimental duct obstruction.

This finds confirmation in my own work. I have extracted the liver for its glycogen content in normal and jaundiced dogs. From two to six weeks previous to the extraction of the jaundiced dog's liver, the common duct was divided between ligatures and the gallbladder was removed. The normal and jaundiced dogs were kept on a mixed diet containing considerable amounts of carbohydrate. They were last fed at 5 o'clock in the afternoon and permitted to keep all uneaten food during the night. At 9 the next morning, they were anesthetized with iso-amyl ethyl barbiturate and pieces of the liver were removed. These were extracted for glycogen by the Pflüger method and the glycogen, after conversion into dextrose, was estimated by the method of Hagedorn. The normal dogs' livers (eleven animals) contained an average of 5.5 per cent of glycogen per hundred grams of liver, while the livers from dogs with obstructed bile ducts (nine animals) contained only 1.4 per cent of glycogen. These figures, presented in the accompanying table, would indicate that the liver of the jaundiced animal was unable to store glycogen to the same extent as that of the normal dog.

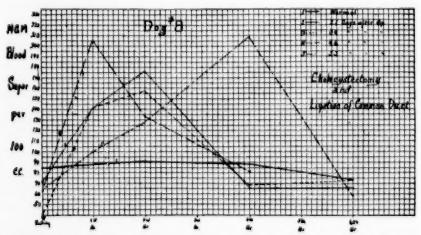

Fig. 3.—Blood sugar curves obtained after feeding 5 Gm. of dextrose per kilogram of body weight to a dog before and after experimental jaundice (Ferguson).

In several instances the extractions were checked by examination of the liver tissue after the latter had been stained by Best's carmine method. In these one

Glycogen Content of the Liver of the Dog After Experimental Common Duct Obstruction

	Percentage per Hundred Grams of Liver
Normal animals (11 animals)	5.5
Jaundiced animals (9 animals) (operation 2 to 6 weeks previously)	1.4

can observe a marked difference in the presence of glycogen granules in the two types of liver. In the normal dogs, the glycogen granules are uniformly distributed throughout the liver lobule, while in the jaundiced dog the granules are most marked around the central portion of the lobule and are lacking or nearly lacking in the periphery of the lobule.

Forsgren [12] has recently published an interesting observation on glycogen storage in the liver. While studying the relationship between the formation of bile and glycogen in the liver of the rabbit, he found that a cycle existed in the normal animal during which the percentage of glycogen and bile varied inversely to each other. Thus, the glycogen was low when the bile was greatest in amount, and vice versa. He also found that glycogen is first deposited around the central vein of the lobule and remains there longest (fig. 5). If a condition exists in the jaundiced animal or patient similar to that found by Forsgren in the normal animal, one can easily see why obstruction of the duct leads to a decreasing glycogen content of the liver. Even

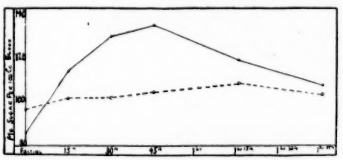

Fig. 4.—Unbroken line, average composite curve of normal persons; broken line, average composite curve of patients with severe hepatic injury. Ten minims (0.6 cc.) of epinephrine hydrochloride was given intramuscularly.

without this explanation, it is only necessary to examine microscopically sections of the liver from patients suffering from an obstruction of the common duct to realize that such a liver is not capable of functioning normally as a glycogen storehouse.

EFFECT OF CARBOHYDRATE ON LIVER REGENERATION

Some years ago, it became known that the liver which contained a large amount of carbohydrate was not as susceptible to the degeneration which occurs following chloroform and, at times, ether, as the liver which contained only a small amount of glycogen. The healthy adult human being of 75 Kg. has a liver weighing approximately 1,700 Gm. Davis, Hall and Whipple [13] have shown that chloroform (during a fasting period) will destroy one half or more of this liver tissue. Under favorable circumstances (high carbohydrate diet) complete repair will occur in from seven to nine days. This means a repair of 100 Gm. of liver tissue a day. The magnitude of this daily repair is as great as the weight of the normal spleen or kidney. (They have shown also that the nitrogen excretion of a dog increases suddenly after chloroform injury. It is much greater in a fasting than a sugar-fed animal.) These observations are of considerable

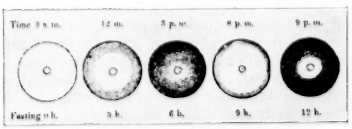

Fig. 5.—Diagrammatic distribution within the liver lobules of the bile constituents (black) and glycogen (white) in fasting rabbits at different times of the day. The fasting commenced at 9 a. m. (In the center of the round surface is the vena centralis.) After Forsgren.

importance from several points of view. They demonstrate the protective action of the liver glycogen against postanesthetic degenerations and illustrate the striking recuperating property of the liver cell. That this

12. Forsgren, E.: Skandin. Arch. f. Physiol. **53**: 137, 1928; **55**: 144, 1929.

13. Davis, N. C.; Hall, C. C., and Whipple, G. H.: Rapid Construction of Liver Cell Protein on Strict Carbohydrate Diet Contrasted with Fasting, Arch. Int. Med. **23**: 689 (June) 1919. Davis, N. C., and Whipple, G. H.: Liver Regeneration Following Chloroform Injury as Influenced by Various Diets, ibid. **23**: 711 (June) 1919.

ability of the injured liver cell to regenerate on a rich carbohydrate diet is not confined to postanesthetic degenerations but is found also in the degenerations following obstruction of the extrahepatic biliary passages is proved by figures 6, 7, 8 and 9.

Figure 6 (dog 434) is a photomicrograph of a section from the liver of a dog which had an obstruction of the common duct and cholecystectomy.

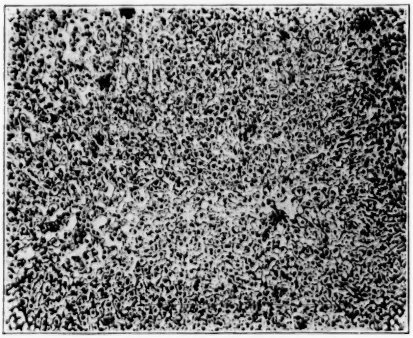

Fig. 6.—Section of liver from dog 434 after the production of experimental obstruction of the common duct.

Figure 7 shows a similar lesion in another dog operated on at the same time (dog 435).

Figure 8 is from the liver of dog 434 ten days after release of the obstruction, the dog having been fed a fat-protein diet during this time. There is still considerable liver injury present.

Figure 9 is from dog 435 taken a similar number of days after the release of the obstruction and the feeding of a rich carbohydrate diet. Anesthesia was not a factor in these cases since iso-amyl-ethyl barbiturate was used. The liver of the dog fed on a high carbohydrate diet shows a greater return to the normal cellular structure.

I believe that it can be said with assurance that the administration of dextrose previous to operation improves the condition of the patient and reduces the operative risk. Whether or not the liver cells can regenerate even to a limited extent while the obstruction is maintained is not as yet definitely known. It is my belief, based on a study of sections taken from the liver of dogs with obstructive jaundice, that the liver cell injury is not, as a rule, as great in those animals kept on a rich carbohydrate diet as it is in those given a poor carbohydrate diet. It must be admitted, however, that the difference is not always striking. After operation dextrose will improve the condition of the liver cells. Its effect is greater after the removal of the factor causing the liver injury. The bile duct obstruction causes not only a degeneration of the parenchymal cells but also a retardation of the portal blood flow through the liver which still further harms the cells. Thus, while normally the portal blood which contains the carbohydrate absorbed from the intestinal tract passes entirely through the liver, in patients suffering from bile duct obstruction it is likely that a portion of this blood is diverted into the newly formed collateral circulation and thus shunted away from the liver. In the dog this can be easily demonstrated.

A high carbohydrate diet or large amounts of dextrose intravenously are just as important or more so following operation as before it. Cell regeneration will take place and the hepatic functions will be resumed much earlier in those patients receiving large amounts of carbohydrate than in those kept on a poor carbohydrate diet.

THE UTILIZATION OF DEXTROSE

I am convinced that the use of dextrose in dilute (isotonic or slightly hypertonic) solutions is of more help in these cases than is the 50 per cent solution dispensed by American pharmaceutic firms. There are two reasons for this: First, the solution can be given more slowly and there is much less danger of its spilling over in the urine. It is therefore more readily utilized. Second, evidence has accumulated that dehydration seriously impairs the ability of the liver to remove the injected dextrose. Tisdall, Drake and Brown [14] ascribe this to a functional derangement of the liver cells resulting in either an increased glycogenolysis or a decreased power of storing the carbohydrate. Mautner [15] has shown that, during the storing of injected dextrose, the liver increases its water content and that in dehydrated animals glycogen formation does not take place. Since many of these patients are dehydrated, it is advisable, if the dextrose is given in concentrated form, that the patient receive sufficient saline solution between the dextrose injections to overcome any existing dehydration. An argument against the isotonic or slightly hypertonic solutions has been the frequency of postinjection reactions. These reactions are not due to the dilute dextrose but to the fluid used for diluting the dextrose and to errors in the method of its administration. These are not within the province of this paper.

The intravenous injection of dextrose is an old procedure. Doyon and Dufourt [16] were the first to

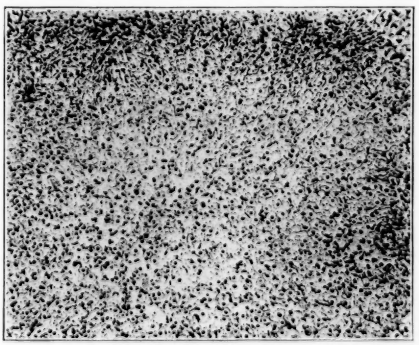

Fig. 7.—Section of liver from dog 435 after the production of experimental obstruction of the common duct.

discover that the rate of intravenous administration influenced the amount of sugar excreted. There can be no doubt, as Wilder and Sansum [17] have pointed out,

14. Tisdall, F. F.; Drake, T. G. H., and Brown, Alan: Production of Lowered Carbohydrate Tolerance in Dogs, Am. J. Dis. Child. **32**: 854 (Dec.) 1926.
15. Mautner, H.: Arch. f. exper. Path. u. Pharmakol. **126**: 256, 1927.
16. Doyon and Dufourt: J. de physiol. et de path. gen. **3**: 703, 1901.
17. Wilder, R. M., and Sansum, W. D.: Glucose Tolerance, Arch. Int. Med. **19**: 311 (Feb.) 1917.

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that the rate at which sugar is brought to the tissues must be controlled if it is desired to measure its rate of utilization. Certainly, when a lowered tolerance exists, as it does in the severely injured liver, the importance of the very slow administration must not be lost sight of. This is frequently forgotten by the intern who injects the solution as rapidly as possible in order to "be through with the job," little realizing that a considerable amount of the injected sugar is pouring out through the kidney glomeruli.

DEXTROSE OR DEXTROSE AND INSULIN?

The influence of insulin on liver glycogen is of interest to us only with regard to its performance when given in association with dextrose. The experimental work on this subject has been done on normal animals receiving dextrose and insulin and, even here, there exists a considerable divergence of opinion. Some investigators (Bissinger, Lesser, and Zipf;[18] Collazo, Händel and Rubino,[19] and Barbour and his co-workers[20]) believe that insulin increases glycogen storage

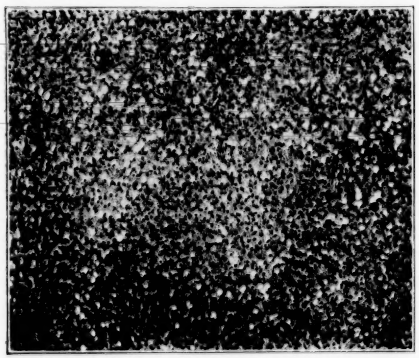

Fig. 8.—Section of liver of dog 434 ten days after the release of the obstruction, the dog having been fed a fat-protein diet during that time. Attention is called to the fatty infiltration of the liver.

in the liver. Others (Babkin;[21] Brugsch, Benatt, Horsters and Katz;[22] B. and C. Heymans;[23] McCormick and Macleod,[24] and Cori[25]) believe that insulin causes no change in the rate of glycogen deposition in the liver, or that it decreases it. A review of the recent work done on this subject makes it more probable that under insulin influence no more glycogen is deposited in the liver of the normal animal than is deposited in control animals receiving a similar amount of dextrose. In fact, it may even retard the glycogen deposition.

Since the blood sugar in the patient with an obstruction of the common duct is as a rule within normal limits, there is no available evidence that pancreatic function, at least so far as its internal secretion is concerned, is impaired. The danger of injecting large amounts of insulin, especially if an attempt is made to administer the carbohydrate orally, lies in another direction. The blood sugar is not an index to the liver glycogen reserve and a normal blood sugar has been repeatedly found in patients and animals in which, either by glycogen estimations or by their response to epinephrine, there was evidence that the liver glycogen

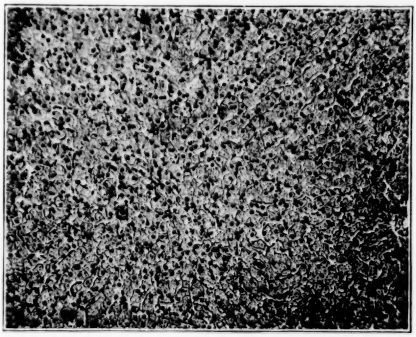

Fig. 9.—Section of liver of dog 435 ten days after the release of the obstruction, the dog having been fed a rich carbohydrate diet during that time.

reserve was nearly depleted. The lack of glycogen storage in the face of a normal blood sugar in the non-starved patient or animal is evidence against the fact that it is necessary to administer insulin with the dextrose in these cases. As yet, no experimental evidence has been presented to show how glycogen deposition may be affected in the severely injured liver by insulin, and this offers a fertile field for investigation. Until such evidence is presented, insulin should be used cautiously and if at all only after dextrose has been administered.

However, there is a small group of patients suffering from severe hepatic injury in association with an apparent diabetes. In these, the fasting blood sugar is high and here insulin should be given with dextrose since

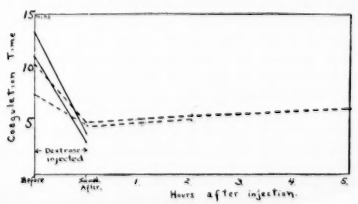

Fig. 10.—Effect of dextrose on the coagulation time of jaundiced patients and dogs: solid line, human beings; broken line, dogs.

only under such circumstances can dextrose be utilized in the process of glycogen deposition in the liver (Banting, Best, Collip, Macleod and Noble;[26] Fisher and Lackey[27]). However, when diabetes coexists with lesions associated with severe hepatic injury, consider-

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27. Fisher, N. F., and Lackey, R. W.: Am. J. Physiol. **72**: 43 (March) 1925.

able caution must be exercised in regard to the use of insulin. It is well known that in these cases it is difficult to maintain a fairly constant blood sugar level, and small doses of insulin may produce hypoglycemic reactions unless sufficient carbohydrate is available. Furthermore, the recovery of the blood sugar level is retarded much the same as it is in the starved animal which is given insulin when the liver glycogen has been greatly depleted. The intravenous administration of dextrose with insulin is much to be preferred in this type of patient.

ANESTHESIA

Chloroform and ether both give rise to a hyperglycemia, after which a reduction of liver glycogen can be demonstrated. Although nitrous oxide and oxygen anesthesia does not cause this to the same degree, it may cause considerable glycogenolysis if asphyxia occurs during anesthetization (Edie, Moore and Roaf;[28] Macleod;[29] Macleod and Pearce[30]). Sansum and Woodyatt[31] demonstrated that dogs lose considerable amounts of dextrose during the administration of anesthetics and narcotics. The extra sugar, they believe, came from preformed glycogen. Macleod and Pearce[30] have also shown that in anesthetized dogs there is a rapid disappearance of glycogen from the liver. Furthermore, chloroform and ether act on the liver to produce further degeneration. Ferguson and Embden[32] have recently demonstrated a diminution in the liver glycogen of the frog after anesthesia with a corresponding rise in the muscle glycogen. All of this work is in agreement with the work of Rosenthal and Bourne,[33] who found an interference with hepatic function after anesthesia. In my opinion, local, splanchnic or spinal anesthesia is to be preferred to any other type of anesthesia in these cases.

I do not believe that morphine should be administered to these patients as a routine procedure. Morphine gives rise to a fairly persistent hyperglycemia at the expense of the liver glycogen and anything which produces a hyperglycemia may eventually lead, especially when the available reserve is low, to hypoglycemia. This may partially explain why clinicians have observed that morphine acts unfavorably in the jaundiced patient.

Since iso-amyl-ethyl barbiturate has very little effect on the carbohydrate metabolism, it might be used instead of morphine, but work recently published would indicate that the liver may not be able to store glycogen in normal amounts when the animal is under the influence of the barbiturate.[34] I do not believe, however, that small doses of iso-amyl-ethyl barbiturate used as a sedative would exert this influence; at least it will not still further deplete the available glycogen stores.

Whenever an inhalation anesthetic is used or morphine administered, dextrose should be administered before and during or immediately after the operation.

OTHER EFFECTS OF DEXTROSE

For some years it has been the practice to prepare the jaundiced patient for operation by administering dextrose and calcium before operation. I have never been able to satisfy myself that a calcium deficiency exists in these patients. I base my opinion on a number of estimations of serum calcium done on the jaundiced human being and the dog. Nor could I find any marked changes in either the ionizable or the nonionizable calcium. It is true that Buchbinder and Kern[35] apparently demonstrated a low calcium value in the blood of young pups after experimental common duct ligation; but, as far as can be ascertained, no one has actually demonstrated a quantitative deficiency in adult dogs or in man.

That fewer postoperative hemorrhages occur since the modern preparation of the jaundiced patient for operation does not mean that the injected calcium is of any particular value. The coagulation time in many of these cases as well as the bleeding time is within normal limits of the methods used. For the last year Morrison and I have been conducting a series of studies on this subject, using the Lee-White method for determining the coagulation time. We have come to the conclusion that the reduction in coagulation time frequently observed during the preparation of the patient and the fewer postoperative hemorrhages are the result of the dextrose used previous to the operation. We have demonstrated a marked reduction in the coagulation time of the blood of the jaundiced and normal patient and dog after the intravenous administration of dextrose (fig. 10). Other sugars do not produce the same results, nor does sodium chloride given in concentrations which will exert the same osmotic pressure. The hepatectomized dog and the patient with an irreparable hepatic lesion fail to respond favorably to dextrose, nor do they respond to intravenous calcium chloride. The important rôle of the liver in maintaining the normal coagulability of the blood has long been known and experiments and clinical evidence indicate that destruction or serious injury of the liver with an impairment of liver function seriously affects blood coagulation.

The entire question will be discussed in another paper, but the work is sufficiently interesting to be reported here. The exact mechanism by which these changes are brought about by dextrose is not quite clear to me as yet. Certainly the dextrose cannot repair liver cells ten or twenty minutes after its injection. Within this time a marked reduction in the coagulation time can be demonstrated which has been maintained in some cases for as long as six and one-half hours before showing any evidence of returning toward the original level—this in the face of a marked dilution of the blood.

POSTOPERATIVE EFFECTS

I have said previously that I believe that the postoperative administration of dextrose and the maintenance as soon as possible of a rich carbohydrate diet are essential for the early recovery of the injured liver. Patients receiving large amounts of carbohydrate undoubtedly do better and recover liver sufficiency earlier than do those on a haphazard hospital "light" diet.

Dextrose serves another useful function after operation. Certain of these patients develop so-called liver shock following release of the obstruction and, in my experience, nothing is as useful or life-conserving in these cases as dextrose. Whether the vascular depression is part of a hypoglycemic reaction or the result of an outpouring of vasodepressor substances no one can

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definitely state. In either instance, dextrose intravenously is often a life-saving measure in antidoting the symptoms. The hyperthermia which characterizes some of these cases is further evidence for the need of dextrose to take care of the increased metabolism. It is my opinion that these shocklike states do not occur as frequently if dextrose has been given properly before and immediately after operation.

The use of epinephrine or solution of pituitary in these cases is as yet a moot point. There can be little doubt that the hyperglycemia and glycosuria which follow epinephrine injection are the result of the mobilization of liver glycogen. Thus, when a large glycogen storage is desirable, the injection of epinephrine or solution of pituitary at least temporarily defeats this purpose. Although after a period of time the epinephrine may actually increase the liver glycogen, its use is not desirable when dextrose will produce a more satisfactory and lasting result.

Bainbridge and Trevan [36] have shown that large doses of epinephrine in dogs cause a swollen and intensely engorged liver. Even small doses cause an increase in the volume of the liver. The increase begins almost immediately and is associated with a rise in portal pressure which must express itself in a more evanescent effect of the epinephrine on the systemic arterial pressure.

SUMMARY AND CONCLUSIONS

Evidence presented here indicates a deficiency of the carbohydrate metabolism in hepatic disease. The decreased ability of the injured liver cells to synthesize and store glycogen is of especial significance to the surgeon. This absence of glycogen occurs at the time when it is most needed. The liver cells regenerate rapidly on a high carbohydrate diet. They will not regenerate to a similar extent on a diet low in carbohydrate. Available evidence does not seem to indicate that insulin is necessary with dextrose in patients suffering from common duct obstruction unless there is evidence that there exists also a deficiency of the internal secretion of the pancreas. Dextrose after operation is of as much value as before operation, if not more. Dextrose causes a reduction in the coagulation time. It is apparently more effective in this regard than calcium chloride. Dextrose is preferable to epinephrine in postoperative "liver shock." In order for the dextrose given intravenously to be utilized it must be injected slowly. Dilute solutions are preferable to small amounts of markedly hypertonic dextrose. The injected dextrose is better utilized in the patient who is not dehydrated.

3400 Spruce Street.

36. Bainbridge, F. A., and Trevan, J. W.: J. Physiol. **51**: 460 (Dec.) 1917.

Volkmann's Contracture.—Volkmann's ischemic contracture results from severe injury to the arm, forearm or elbow, usually a supracondylar fracture of the humerus. It occurs most commonly in children between the ages of 6 and 14 years and is rarely encountered in adults. Schultze and Eitel believe that the explanation of its frequent occurrence in children is to be found in the fact that the blood supply to the muscles in children is much less per volume than in adults and that consequently interference with the blood supply to muscles in children causes much more damage than in adults. The actual causative factor which is responsible for the condition is compression of the blood vessels and nerves at the elbow or below, interfering with the circulation on one hand and nerve conductivity on the other.—Dickson, F. D.: Volkmann's Ischemic Contracture, *New Orleans M. & S. J.*, September, 1929.

COMPLETE EXTERNAL BILIARY FISTULA

A POTENTIAL SERIOUS POSTOPERATIVE COMPLICATION *

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Persistent external biliary fistula was a common sequel of operations on the gallbladder in the early days of biliary tract surgery. In 1894, Murphy [1] pointed out that in 201 reports of cholecystostomies collected by Courvoisier, Riedel and himself, a permanent external fistula had obtained in 31 per cent of the cases. In only 3 per cent was obstruction in the common bile duct responsible for the continued external discharge of bile; in the remaining 97 per cent the explanation of the persistent fistula was to be found usually in faulty surgery; viz., in the suture of the mucous membrane of the gallbladder to the skin or the fixation of the gallbladder to the abdominal wall in the closure of the wound. Today, persistent external biliary fistula occurs usually as the result of an overlooked obstruction in the biliary tract when the gallbladder was operated on. Since cholecystectomy has supplanted cholecystostomy as the operation of choice when the gallbladder is diseased, persistent external biliary fistula is much less often seen as a complication of gallbladder surgery. Spontaneous external biliary fistula today is a medical curiosity.

The current medical opinion of that time was that protracted loss of bile in large amounts per se had no deleterious influence on the organism. In 1885, Bernays [2] said that "the bile is almost if not entirely as much of an excretion as the urine." In some instances, he said, patients have gained in weight and health while losing all their bile through a fistula. In a footnote in the same article, he refers to a negress operated on by Hodgen, who had continued in good health for eleven years, during which time all the bile was discharged externally. In 1890, Mayo-Robson [3] reported some observations on the secretion of bile in a case of complete external biliary fistula of fifteen months' standing. He concluded that "increase of body weight and good health are quite compatible with the entire absence of bile from the intestines," and gave it as his opinion that "bile is probably chiefly excrementitious, and, like the urine, is constantly being formed and cast out." Reports of a number of cases of a similar nature were collected by Courvoisier [4] which indicated that the continued loss of bile was well borne.

This conclusion would appear to coincide with contemporary medical opinion. In one of his essays on surgical subjects, Moynihan [5] says, "I can recall more than one case of permanent biliary fistula in the old days, when every drop of bile was discharged on to

* From the Department of Surgery of the University of Minnesota Medical School.
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2. Bernays, August: A Successful Case of Ideal Cholecystostomy with Critical Remarks on the Pathology and the Different Operative Procedures Practiced on the System of Gall Vessels, Weekly M. Rev. **12**: 350, 1885.
3. Mayo-Robson, A. W.: Observations on the Secretion of Bile in a Case of Biliary Fistula, Proc. Roy. Soc. **47**: 499, 1890.
4. Courvoisier, L. G.: Casuistisch-Statistisch Beiträge zur Pathologie und Chirurgie der Gallenwege, Leipzig, 1890, p. 293.
5. Moynihan, Berkeley: Acute Emergencies of Abdominal Disease, Essays on Surgical Subjects, Philadelphia, W. B. Saunders Company, 1921, p. 144.

the abdominal wall, and was lost to the economy. In spite of this, there was no apparent diminution in bodily health or weight or capacity." Deaver [6] asks, "What proof is there that the loss of bile per se is harmful?" In several surgical monographs on the subject of biliary tract disorders and in the best known surgical treatises and textbooks, I have failed to find any reference to injurious effects from prolonged loss of bile to the exterior. The particulars that receive discussion are the etiologic factors involved and the surgical problem concerned in the extirpation of the fistula.

In an article in 1921 on postoperative biliary fistulas, Balfour and Ross [7] raised the question as to how long external drainage of the bile may continue without evident effect on the general health of a patient. In their series of 166 cases, though protracted external drainage occurred in many instances, definite recognizable disturbances were never seen incident to the loss of bile, other than anemia.

It is well known, however, that in the experimental animal, though total loss of bile may be temporarily compatible with life, protracted external discharge of the bile without regulation of the diet results in emaciation and death. In 1844, Schwann [8] established complete external biliary fistulas in dogs. One lived eighty days and another sixty-four. All the dogs operated on died of emaciation and loss of strength. Bidder and Schmidt [9] repeated these experiments in 1852 with the same result. They succeeded in keeping one dog in good health for eight weeks by a feeding of bread and meat. Röhmann [10] in 1882 established complete external biliary fistulas in two dogs that were carefully fed and, much to his surprise, marasmus did not supervene. Hooper and Whipple [11] say, "We are convinced from our work that bile is a necessary life factor for a dog fed upon any common mixed diet," and that, "if bile is wholly excluded from the intestinal tract, the dog loses ground steadily, shows intestinal disorders, accompanied by blood in the feces, and usually within a month dies with peculiar symptoms of intoxication."

They found that the administration of fresh dog or ox bile to biliary fistula animals by stomach tube was beneficial but did not maintain the dogs in good nutrition. Cooked liver, they found, kept the dogs in good health. Later, Wisner and Whipple [12] stated that they had kept dogs with complete external biliary fistula in good health from two to four years on liver feeding. More recently, Smith, Groth and Whipple [13] have successfully maintained bile fistula dogs on a salmon-bread regimen. Careful regulation of the diet, they insist, is necessary to obviate impairment of the animals' health.

In the autumn of 1928, at the University Hospital in Minneapolis, two cases of external biliary fistula were seen in which there was profound loss in weight and deterioration in strength incident to the external discharge of bile.

6. Deaver, J. B., in discussion on Heyd, C. G.: Cholecystogastrostomy and the Courvoisier Gallbladder, J. A. M. A. **77**: 341 (July 30) 1921.
7. Balfour, D. C., and Ross, J. W.: Postoperative Biliary Fistulas, Arch. Surg. **3**: 582 (Nov.) 1921.
8. Schwann, T. H.: Versuche um Auszumitteln ob die Galle im Organismus eine für das Leben wesentliche Rolle spielt, Arch. f. Anat. u. Physiol., 1844, p. 127.
9. Bidder and Schmidt, quoted by Röhmann (footnote 10).
10. Röhmann, F.: Beobachtungen an Hunden mit Gallenfistel—Habilitationsschrift, Breslau, 1882.
11. Hooper, C. W., and Whipple, G. H.: Bile Pigment Metabolism: I. Bile Pigment Output and Diet Studies, Am. J. Physiol. **40**: 332 (April) 1916.
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13. Smith, H. P.; Groth, A. H., and Whipple, G. H.: Bile Salt Metabolism: I. Control Diets, Methods and Fasting Output, J. Biol. Chem. **80**: 659 (Dec.) 1928.

REPORT OF CASES

CASE 1.—*History.*—Mrs. M. W., aged 64, with several children, was admitted to the University Hospital, Sept. 29, 1928, with the complaint of an external biliary fistula dating since August, 1927, at which time her gallbladder was drained elsewhere. Since then, there had been a persistent discharge of bile to the outside.

Since 1904, the patient had complained of fulness and epigastric distress after meals, and of intolerance to fatty foods. In 1904, she had an acute attack of upper right quadrant pain, followed by jaundice. Save for quantitative and qualitative food intolerance, the patient had been relatively free from severe distress. In 1922, she suffered an unusually severe attack, the pain in the upper part of the abdomen being so severe as to cause her to fall in a faint. Following a similar attack, Aug 15, 1927, she was operated on as an emergency measure. An empyema of the gallbladder was found. Several stones were evacuated, and tube drainage of the gallbladder was instituted. There had been a moderately profuse external discharge of bile from the wound ever since. The patient left the hospital a month after operation but had gradually declined in strength and weight. Her weight prior to the establishment of external drainage was 143 pounds (65 Kg.); on admission to the University Hospital, a little more than a year later, the weight was only 89 pounds (40.4 Kg.), a loss of 54 pounds (24.5 Kg.).

Fig. 1 (case 1).—Appearance of patient after she was able to be up. She had been confined to bed because of weakness for several months prior to admission. The weight loss since the establishment of the external biliary fistula was 54 pounds (24.5 Kg.).

The patient continued up and about till January, 1928, after which time she became more and more confined to bed. Since May, 1928, the patient had been constantly in bed, unable to be up and about. There had been a distaste for fatty foods since the operation of August, 1927. The appetite had become increasingly poorer. In the past few months, the patient had frequently been confused and had suffered delusions of persecution.

The estimated daily average excretion of bile through the biliary fistula had been about 8 ounces (240 cc.) a day. Following an attempt at clamping the tube in June, 1928, the patient became jaundiced. More recently, the external drainage of bile has been less in amount. The patient had been taking charcoal daily by mouth for a long time, and the stools had been black. Previously, however, the stool usually exhibited a trace of brown, despite the external loss of bile.

Physical Examination.—The patient was emaciated, with an unusual pasty, inelastic skin, showing evidence of excessive and prolonged loss in weight. The heart and lungs were normal. The blood pressure was 165 systolic and 90 diastolic; the pulse varied in frequency from 90 to 100; the temperature was normal. In the upper right quadrant of the abdomen was a vertical scar with a drainage tube in situ. There were no areas of tenderness, and no masses were felt. The pelvis, rectum, extremities and reflexes were normal.

Laboratory Examination.—The blood tests showed: hemoglobin, 82 per cent; red blood cells, 4,300,000; white blood cells,

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7,000, with 65 per cent polymorphonuclears and 35 per cent lymphocytes. The icterus index was two units. The blood Wassermann reaction was negative. A trace of bile pigment was detected in the stool. Frequent examinations of the urine showed an occasional trace of albumin; a few pus cells were regularly present.

Fig. 2 (case 1).—Appearance of the spine, showing extreme osteoporosis of the vertebral bodies; the aorta is calcified.

The blood urea was 13.06 mg. per hundred cubic centimeters; the blood sugar, 10.6 mg. per hundred cubic centimeters.

The plasma chlorides were 478.9; the serum calcium was 10 mg. per hundred cubic centimeters, and the bleeding and clotting time were normal. The blood was of group III.

The collected external drainage of bile varied between 50 and 70 cc. a day, and about an equal amount escaped into the dressings. It was rather pale. The daily excretion of sodium chloride in the collected bile varied from 0.2 to 0.819 Gm. a day, with a mean value of 0.4 Gm. Roentgenograms of the spine and pelvis exhibited a marked osteoporosis.

The patient was very weak and ate poorly. She was frequently confused and maniacal. Attempts at forced feeding with a duodenal tube were unsuccessful because of lack of cooperation from the patient. Bile salts given in capsules to the amount of 3 Gm. a day, however, the patient took without much complaint. She appeared to gain somewhat in strength and gradually became able to sit in a chair, and to walk with assistance. The patient continued to lose in weight, and after almost two months of observation and attempts at building up her reserve, the patient weighed only 85 pounds (38.6 Kg.), 4 pounds (1.8 Kg.) less than on admission.

It was therefore felt that, despite the hazards of operation, the patient should have the benefit of an exploration. The preoperative diagnosis was external biliary fistula (incomplete), cause undetermined.

Operation (Dr. Wangensteen).—The abdomen was opened under ethylene and ether anesthesia through a right rectus incision. The gallbladder was found to be enormously thickened, having an external circumference of 4 inches (10 cm.) or more, but with a lumen that would scarcely admit the examining finger. The gallbladder was intimately adherent to the liver as an inflammatory mass. The common bile duct was dilated, but no obstruction could be made out in the duct. Examination of the remainder of the peritoneal cavity was negative.

Because of the extensive disease in the gallbladder, it was felt best to accept the increased risk of considering the obstruction in the common bile duct a removable one. The lesser procedure of anastomosis between duodenum or stomach was scarcely feasible because of the extensive disease in the gallbladder. The common bile duct was incised longitudinally, and a probe was passed into the liver ducts with ease. Near the terminal end of the common bile duct, the exploring probe encountered obstruction. Not even the finest probe could be passed into the duodenum. When the duct was probed with a curet, a portion of a gallstone was found to occupy the hollow of the instrument. A probe still could not be passed into the duodenum. The probe in the terminal end of the common bile duct was then pushed up against the anterior duodenal wall, and a longitudinal incision in the duodenum exposed the papilla of Vater. There was definite stricture formation at this point, and only after division of the stricture with scissors could the remaining fragment of the stone be removed and the probe in the duct above be pushed into the duodenum. A catheter was then threaded into the duodenum through the common bile duct, and the proximal end was led out through the abdominal wound. The anterior wall of the duodenum was closed transversely by three rows of sutures, and the opening in the common bile duct was carefully closed about the tube. The major portion of the gallbladder was cut away, leaving a small stump into which a tube drain was inserted, with the idea that it might serve as a vent for the escape of bile. The omentum was turned upward over the anterior aspect of the duodenum, and sutured carefully to the abdominal wall and gastrohepatic omentum, in such a manner as to extraperitonealize the operative field. Three Penrose drains were inserted, and the abdomen was closed.

Postoperative Course.—On the completion of the operative procedure, the patient was in good condition. In the afternoon, the systolic pressure fell to 75 and the patient was given a transfusion. Following the transfusion, her condition continued good, but despite the administration of 3,000 cc. of physiologic solution of sodium chloride subcutaneously, only 5 cc. of urine was obtained by catheter within twenty-four hours after operation; for the first forty-eight hours this amount was 250 cc., and on the morning of the third day the patient exhibited twitchings of all extremities and the face, not typical of tetany. The serum calcium was taken, and was found to be 9 mg. per hundred cubic centimeters of blood; the blood urea was 38 mg., and by the Van Slyke test, 38 per cent by volume.

Five hundred cubic centimeters of 15 per cent dextrose was given intravenously, and a good diuresis was obtained, 1,300 cc.

Fig. 3 (case 2).—Appearance of patient after cholecystostomy. All the bile drained to the outside. The patient steadily grew weaker and lost 21 pounds (9.5 Kg.) within three weeks of operation. Following a cholecystoduodenostomy the patient improved temporarily. Retention of urine caused by prostatic hypertrophy caused death. A carcinoma of the head of the pancreas was found at necropsy.

of urine being excreted in the next twenty-four hour period. Parathyroid extract-Collip was given subcutaneously and calcium chloride intravenously, without apparent effect on the twitchings. Spinal puncture was also done, showing a normal pressure of the spinal fluid and a normal cell count.

Milk and cream were frequently given in small amounts by the tube in the common bile duct that ran into the duodenum.

The patient died on the fifth postoperative day. On the day prior to death, the serum calcium was still 9 mg., and the blood urea was 30 mg. per hundred cubic centimeters. Autopsy was denied, but permission was granted to open the abdominal incision. The peritoneal cavity was clean, and there was no trace of fluid present. The operative site was in good condition.

CASE 2.—*History.*—H. F., aged 68, a laborer, admitted to the University Hospital, Aug. 16, 1928, with the complaint of pain in the upper part of the abdomen of two months' duration, had lost 26 pounds (11.8 Kg.) since February, and also complained of loss of strength.

Two years previously, the patient attended the outpatient clinic of the hospital because of nocturia and dribbling after urination. A voided specimen of urine at that time was clear; the prostate was found to be rather hard and firm, but its outline was smooth and it did not appear enlarged. When he came to the hospital in August, 1928, he still complained of nocturia and difficulty in starting the urinary stream.

Physical Examination.—The patient was well developed but somewhat thin. The heart and lungs were normal. The blood pressure was 124 systolic and 72 diastolic. The temperature and pulse were normal on admission. Examination of the abdomen demonstrated marked tenderness below the xiphoid process and over the gallbladder region. No masses were made out. Digital examination of the rectum showed the prostate to be small and hard as previously. There was no residual urine.

Examination of the urine was negative. No bile pigment was present.

Blood tests showed: hemoglobin, 84 per cent; red blood cells, 4,700,000; white blood cells, 5,700, with a normal differential count.

The blood urea nitrogen was 14 mg. per hundred cubic centimeters.

The Wassermann reaction was negative.

The stools were negative for blood.

Roentgen examination of the lungs showed fibrosis in both apexes, the result of a moderately advanced bilateral pulmonary tuberculosis. The kidneys, ureter and bladder were normal. Gallbladder plates made after the ingestion of the opaque dye demonstrated a faint gallbladder shadow with a clear center. The appearance suggested a pathologic gallbladder with stone.

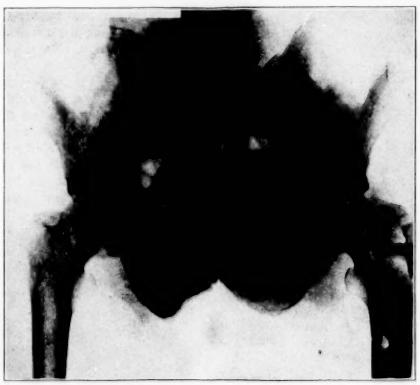

Fig. 4 (case 2).—Osteoporosis of the pelvis and femurs as a result of the external loss of bile.

Two days after admission, an elevation of the temperature to 102 F. occurred with almost daily subsequent oscillations between 98 and 102. Because of the abdominal tenderness and the fever, it was felt that the patient probably had an empyema of the gallbladder.

Operation and Course.—September 5, under ethylene and procaine hydrochloride infiltration anesthesia (Dr. James Johnson), the abdomen was opened through a right rectus incision. The gallbladder was found to be thick walled and distended. It contained a stone about 4 cm. in diameter. The common bile duct was also somewhat dilated, and the pancreas felt unusually firm throughout. The gallbladder was opened, bile was found to be present and the stone was removed. A small longitudinal slit was then made in the common bile duct and the duct was probed. There appeared to be two narrowings in the duct near its terminal end, but a good sized probe could be pushed into the duodenum without difficulty. As the cause of the dilatation of the common bile duct was thought to be an induration of the pancreas, the gallbladder was drained and a catheter was left in the common bile duct, running proximally into the right hepatic duct. One Penrose drain was laid down to the foramen of Winslow and brought out through the midportion of the wound with the other tube drains.

Following the external drainage, the patient did fairly well and the temperature came down to the normal level. The bile continued to drain to the exterior in large amounts, varying from 350 to 510 cc. daily. No bile pigment was demonstrated in the stools. It was soon apparent that the patient was steadily losing ground. On admission, the patient's weight was 116 pounds (52.6 Kg.). October 1, the patient weighed 95 pounds (43 Kg.) and he appeared, to use a descriptive phrase of Dr. Franklin Wright, "to dry up on the cob."

Following the daily administration of ox bile and forced feedings of a high carbohydrate and protein diet, a part of which feedings were given by a duodenal tube, the patient gained in strength and vigor and the weight returned to 101 pounds (45.8 Kg).

The most opportune time was awaited to establish internal drainage of bile, and on November 14 a cholecystoduodenostomy was done. The head of the pancreas at this time was as hard as at the first operation. The tail, however, appeared softer.

The immediate convalescence from this operation was without event, save that the patient had to be catheterized. His appetite increased and on the eleventh postoperative day he was permitted to get up. After the patient had been ambulant for a few days, he complained of frequency of urination. A catheter was again passed and there was found to be considerable residual urine. The blood urea, December 1, was 50 mg. per hundred cubic centimeters. Gradual decompression was instituted, but the urea slowly rose to 85 mg., at which level it was maintained until death, December 16.

Postmortem examination demonstrated an extensive atony of the bladder, with multiple small hemorrhages. The prostate was small but extremely hard (prostatitis). The right kidney weighed 160 Gm. and the left 140. Both showed cloudy swelling.

The liver weighed 1,200 Gm. and the spleen 120. The heart weighed only 180 Gm. and showed marked atrophy of the brown and serous type.

The head of the pancreas was replaced by a hard tumor, a carcinoma which involved the terminal common bile duct.

COMMENT

In the first of these two cases, the patient's ill health was initiated by the biliary fistula. During the latter part of her illness, it would not seem that the loss of bile was great enough in amount to be a serious handicap. However, it is known that, following the protracted external discharge of bile, the bile lessens in amount as does also the solid content of the bile. The whole picture could probably be well accounted for on a nutritional basis, induced by loss of bile and the attendant impaired digestion of fat. It is my impression that this syndrome would fit fairly well into the so-called war or hunger edema described by the Germans during the World War. The basis for such a condition was well established in this patient through prolonged starvation. The twitchings that occurred terminally in the absence of a true uremia and parathyroid tetany could well be correlated with such a nutritional disorder. If a preliminary gastrostomy had been done in this instance, it is barely possible that the

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outcome might have been different. Psychopathic behavior in patients with external biliary fistula has previously been noted by Merkel [14] and Urbach.[15]

In the second patient there had been some loss in weight prior to the establishment of the external drainage, but following the latter procedure the deterioration in strength, weight and health was unusually rapid. The skin, as in the first case, became pasty and inelastic. Following the cholecystoduodenostomy, the patient improved in health and was up and around but died from uremia brought about by prostatic hypertrophy. The carcinoma of the head of the pancreas was an important factor in this man's decline in strength, but it was quite obvious that the external loss of bile accelerated his decline in a large measure.

These observations are not, however, without clinical precedent. A few instances are reported in the literature in which emaciation and deterioration in health have accompanied the loss of bile. Malcolm [16] refers to a patient on whom he performed a cholecystostomy, following which all the bile appeared to drain to the outside. The patient showed rapid emaciation; in the third postoperative week the pulse became feeble and it seemed that the patient would die unless some change was brought about. A cholecystoduodenostomy was done, and immediate improvement began. Willett [17] reports an instance in which he established external drainage by cholecystostomy in the presence of jaundice, with complete obstruction of the common bile duct. The patient left the hospital but died some time later, presumably, Willett states, from the biliary fistula. In his statistical study of the pathologic and surgical lesions of the biliary tract, Courvoisier [4] mentions a patient who came under his observation, who died from an external biliary fistula ten months after its establishment, and refers in the same treatise to the reports of a few other cases in which death was more or less directly attributable to the external loss of bile.

A number of other instances are to be found reported in which, following protracted external biliary drainage, a hunger for bile developed. Ross [18] records such an instance in a man, aged 56, on whom he performed external drainage for an impermeable stricture of the terminal end of the common bile duct. The patient developed a thirst for bile, which he drank from a bottle held by a belt about his waist. The average amount of bile ingested was about 700 cc. a day. The patient gained in weight and strength, and returned to work. A number of similar reports are to be found in the literature, in which the administration of the collected fistula bile by mouth resulted in immediate improvement in the postoperative convalescence of patients who were losing bile externally.

The large number of instances in which patients have continued in excellent health despite total external loss of bile indicates that, for man, bile is not essential for life. Provided the diet of a dog with complete external biliary fistula is well regulated, such loss of the bile is consonant with good health. Man, far more omnivorous than the dog, has an even better chance of tolerating external loss of bile with impunity. During the immediate convalescence after operation, or in a patient with a biliary fistula whose desire or appetite for food does not extend to a variety of things, it is easily apparent that the loss of bile may be the initial factor in a nutritional disorder that may prove serious.

When bile is lost to the exterior for a protracted period, an anemia usually ensues; the bile salts excreted in the bile diminish in amount, and a large amount of the ingested fat appears in the stool in the form of fatty acids (from 45 to 58 per cent, Umber [19]). A concomitant inability obtains to utilize the vitamins of fat (A and D) properly, together with an altered mineral metabolism resulting in a true osteoporosis of bone, complicated occasionally by spontaneous fractures as observed by Pavlov [20] twenty-four years ago and later described by Seidel [21] in man. The mineral metabolism of biliary fistula patients or animals has not been carefully studied. Despite the decalcification of the bones, the serum calcium, however, remains normal. More calcium is lost in the stool through the diminished fat absorption than is lost through the bile. Dieterich [22] has described an hypertrophy of the parathyroids accompanying the osteoporosis of biliary fistula. Düttmann [23] found an acidosis in biliary fistula animals caused by the loss of the alkaline bile. The nonprotein nitrogen of the blood and the plasma chlorides, however, remain normal.

Eckles, Becker and Palmer [24] of the Minnesota Agricultural Experimental Station have made some interesting observations on the mineral metabolism of cattle with depraved appetites that may throw some light on the factors concerned in the osteoporosis accompanying the mineral deficiency of biliary fistula. In veterinary literature, this disease is commonly known as osteoporosis, osteomalacia or fragilitas ossium. The cattle affected present an unthrifty general appearance and exhibit perverted appetites. Stiffness in the joints, a harsh, dry coat, dull eyes, and soft or brittle bones that break easily are features of the disease. These investigators found that the addition of calcium supplements to the basal ration on which the disease could be initiated or continued was without effect either in preventing the onset of mineral deficiency or in curing it when present. The relation of phosphorus, however, they found to be definitely correlated. The feeding of tricalcium phosphate or monobasic sodium phosphate with the basal ration precluded the development of the symptoms of mineral deficiency, and brought about a cure when the disease already existed.

All these phenomena, namely, anemia, diminution in bile salt formation, interference with the digestion of fat and osteoporosis, may occur also in the patient with complete obstructive jaundice, when bile is excluded from the intestine. This nutritional imbalance is not peculiar to exclusion of bile from the intestine, whether by obstruction or by fistula, but would appear also to be akin to the hunger edema [25] and the associated

14. Merkel, Johann: Drei Fälle von Cholecystostomie, Centralbl. f. Chir. **20**: 328, 1893.

15. Urbach, Paul: Über akute Psychosen nach Operationen am Gallengangsystem, Wien. klin. Wchnschr., number 47, 1907, p. 1465.

16. Malcolm, J. D.: Cholecyst-Duodenostomy for Acute Emaciation Following the Formation of a Biliary Fistula, Clin. J. **35**: 239, 1910.

17. Willett, Alfred: Complete Obstruction of Common Bile Duct; Cholecystostomy; Biliary Fistula; Marked Improvement, Brit. M. J. **2**: 903, 1886.

18. Ross, S. G.: A Study of Bile Secretion from a Case of Biliary Fistula, J. Lab. & Clin. Med. **12**: 1067 (Aug.) 1927.

19. Umber, in Hand. d. inn., Med. part 2, **3**: 31, 1926.

20. Pavlov, quoted by Seidel (footnote 21).

21. Seidel, Hans: Permanente Gallenfistel und Osteoporose beim Menschen, München. med. Wchnschr., part 2 **57**: 2034, 1910.

22. Dieterich, Hans: Die porotische Malacie nach Gallenfisteln, Beitr. z. klin. Chir. **134**: 530, 1925.

23. Düttmann, G.: Die Veränderung des Saure-Basengleichgewichtes nach Gallenfisteln und ihre Bedeutung bei der Entstehung der sog. porotischen Malacie, Beitr. z. klin. Chir. (Bruns') **139**: 720, 1927.

24. Eckles, C. H.; Becker, R. B., and Palmer, L. S.: A Mineral Deficiency in the Rations of Cattle, Univ. of Minnesota Agri. Exper. Bull., June, 1926, p. 229.

25. Alwens, Walter: Hungerosteopathie, Handb. d. Inn. Med., part 1, **4**: 659, 1926.

osteoporosis seen during the World War, as well as to the malnutrition accompanying chronic diarrheas, as may be seen in sprue.[26]

Just what elements in the food ingested are necessary to insure good nutrition in the presence of a complete external biliary fistula is not definitely known. Certainly no single food factor is responsible. Animals with complete external biliary fistula may apparently subsist without deterioration in health on a cooked liver regimen,[12] a salmon and bread diet,[13] or on cod liver oil or ergosterol [27] added to an ordinary mixed diet. With total exclusion of bile from the intestine, carbohydrates and protein are better assimilated than fat, but following the administration of bile salts by mouth in sufficient quantity, fat should continue to be absorbed in the normal manner.

Seifert [27] and Tammann [28] believe that the response of biliary fistula animals to cod liver oil and ergosterol indicates a similarity of the nutritional disorder of biliary fistula to rachitis. Tammann has also been able to obviate the occurrence of osteoporosis and spontaneous fractures in biliary fistula animals by the parenteral administration of ergosterol. Under the influence of this therapy, the bony lesions healed after they had once been established.

Important in this connection is the consideration of the deliberate establishment of an external biliary fistula in the presence of complete common bile duct obstruction. With simultaneous removal of the obstruction, whether due to stone or to stricture, external drainage is quite safe and is the procedure of election. To establish external drainage deliberately in the presence of an uncorrected complete biliary obstruction would be to run the danger of a bile fistula in a poor surgical risk. The only advantage that biliary fistula exhibits over biliary retention is that liver injury incident to obstruction of the bile ducts does not obtain in the former. The so-called cholemia dependent on the retention of bile, and especially the bile salts, I believe, has been overrated as a toxic factor in jaundiced patients. Ordinarily, patients tolerate obstructive jaundice well until the destruction of liver tissue occasioned through the block in the common bile duct ushers in threatening symptoms. In irremovable complete obstructions of the bile duct, an initial anastomotic operation to the stomach or duodenum is the procedure of choice. Only when the risk of the operative procedure would be notably decreased by performing external drainage should the increased hazard of external over internal drainage per se be accepted. For obstructions above the point of union of cystic and hepatic ducts in the biliary system, when a primary anastomotic procedure cannot easily be performed, external drainage, followed later by implantation of the fistulous tract into the duodenum, as suggested by Lahey,[29] would probably be more likely to succeed than any other.

Significant in the relation of its merits of external and internal drainage in common duct obstruction is the report of McWhorter on congenital cystic dilatation of the common bile duct. In twenty-two cases, external drainage alone was established. All the patients died without complete recovery. Of the nine patients that McWhorter [30] classed as cured, all eventually had a permanent stoma between the bile duct and the intestine. There was a low mortality only in the cases in which drainage was established into the intestine at the first operation.

It is interesting that a number of McWhorter's patients with cysts of the common bile duct died of hemorrhage after the establishment of an external fistula. Jaundice, however, had been present in these instances before external drainage was done. Küttner,[31] nevertheless, has observed spontaneous hemorrhage in a patient with biliary fistula in the absence of an immediately antecedent jaundice, and Walzel [32] refers to three other such instances in which fatal hemorrhage occurred in patients with external biliary fistula.[33] Wisner and Whipple [12] have also described this complication in a dog with an external biliary fistula of eleven months' standing.

SUMMARY

In the two cases of biliary fistula reported here there was great loss in weight and deterioration in strength incident to the protracted external loss of bile. It is pointed out that man usually tolerates loss of bile to the exterior very well. In dogs, however, less omnivorous than man, complete external biliary fistula is compatible with continued good health only by careful regulation of the diet. In man, the external loss of bile may be the initial factor in a nutritional disorder that may prove serious. In the presence of complete irremovable obstruction in the common bile duct, internal drainage of the bile is to be preferred to the preliminary establishment of an external fistula, followed later by an anastomotic operation. Complete external biliary fistula is not well tolerated by the patient who is a poor surgical risk.

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[EDITORIAL NOTE.—This paper, together with that of Dr. Ravdin, which precedes it, and the papers of Dr. Mentzer and Drs. Cattell and Kiefer, to appear next week, constitute a symposium on hepatic and biliary disease. The discussion will follow the papers to be published in our next issue.]

26. Von Hecker, H.: Die Sprue, Handb. d. Inn. Med., part 2, **3:** 487, 1926.
27. Seifert, E.: Zur Frage der porotischen Malazie nach Gallenfisteln, Beitr. z. klin. Chir. **136:** 496, 1926.
28. Tammann, H.: Über die Beeinflussung der porotischen Osteomalazie nach Gallenfistel durch das D-Vitamin, Beitr. z. klin. Chir. **142:** 83, 1928.
29. Lahey, F. H.: Implantation of Biliary Fistula into Duodenum: A New Method of Treatment, J. A. M. A. **80:** 893 (March 31) 1923.
30. McWhorter, G. L.: Congenital Cystic Dilatation of the Common Bile Duct, Arch. Surg. **8:** 604 (March) 1924.
31. Küttner, H.: Über Hepatargie, chronischen Cholaskos und andere problematische Krankheitsbilder der Gallenwegschirurgie, Deutsche med. Wchnschr., part 2 **49:** 905 (July 13) 1923.
32. Walzel, Peter: Über die radiologische Beurteilung postoperativer Gallenfisteln, Beitr. z. klin. Chir. **139:** 155, 1927.
33. Since this paper was written Dr. Waltman Walters of the Mayo Clinic informs me that he has had a similar experience in a patient who had an external biliary fistula of three months' standing. The patient died of hemorrhage following an attempt to implant the fistulous tract into the duodenum. Instances of this character would lead one to believe that fibrinogen formation, a function of the liver, may also be interfered with when the bile is lost to the exterior.

Physician and Patient.—It was once my good fortune to be thrown into daily association with some British medical missionaries to India who were home for a few months for rest and medical review. They told me that when the Indians, who are great sufferers from eye diseases, could be relieved through the efforts of the missionaries they were not only grateful but as a rule would listen to the gospel story with a confidence and a credence not otherwise easily attained. The same is true, though perhaps in a lesser measure, of the family physician and the patient with whom he comes into frequent professional relationship, a relationship that is necessarily confidential, and almost unconsciously will he be consulted on matters of a wider range than are compassed by the field of medicine and surgery, and thus a relationship develops that makes the physician the custodian of a friendship, or I was about to say a comradeship, seldom or never shared by the patient with his merchant, his grocer, or even with his attorney. —Cotton, T. W.: Confidential Relation of Physician to Patient, *J. Missouri M. A.*, September, 1929.

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ROENTGEN TREATMENT OF VAQUEZ'S DISEASE

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Ever since Vaquez, in 1892, described for the first time the disease that bears his name, an efficient therapy has been sought in vain. Although the clinical description was complete for many years, its pathogenesis remained obscure. The reasons for this long and laborious period lie chiefly in the rarity of the disease, and in the fact that the few cases could rarely be checked by autopsy. I shall not repeat here the clinical picture of the disease.

ETIOLOGY

The first organ held responsible for the syndrome of Vaquez was the spleen. In order to explain the pathogenic mechanism of the disease, it was held that the normal equilibrium between formation and destruction of red corpuscles was broken; that is, that the spleen, an organ eminently erythrolytic, was more or less insufficient, thus resulting in the polycythemia. The observations of Asher and Vogel, who found an increase in erythrocytes after splenectomy, and of Eppinger, limited to two cases, who found a low hemosiderin content in the spleen, led to the belief that an erythrolytic insufficiency of the spleen was the cause of the polycythemia. Subsequently it was demonstrated that polycythemia following splenectomy is always limited and temporary, and only rarely lasts several years. The observation of Eppinger is not sufficient alone to constitute a valid argument in support of the theory of splenic hypo-erythrolysis. The experience of Hirschfeld speaks again of it. In two personal observations he was able to ascertain that there was also a strong increase of erythrophagia in the spleen.

Although it is not possible to admit that as a basis of Vaquez's disease there is no more than an insufficiency of the organs delegated with the destruction of the erythrocytes, one cannot completely exclude the fact that in the fully developed malady there is a relative insufficiency on the part of these organs.

In some cases (Rendu and Widal; Moutart Martin and Lefas Collet, Scharold, Koetlitz) a tuberculosis of the spleen was found. As a result of this finding, the pathogenesis of the disease was attributed to a primary tuberculous involvement of the spleen. But later this hypothesis lost value, and it became necessary to abandon it because of anatomicopathologic observations in succeeding cases, in which no lesion of the spleen was found, and because numerous cases of splenic tuberculosis (Sharold, Winternitz, Stewart) showed no polycythemia. Preiss, Weber, Low and Popper, moreover, described cases in which the cutaneous reaction to tuberculin was negative.

The hypothesis that the blood of persons with Vaquez's disease contained substances capable of stimulating the erythrocytes caused the serum of polycythemic patients to be injected into those affected with pernicious anemia. In 1926, during my service in the Tenth Department of the Policlinico Umberto I in Rome, I injected repeatedly into a girl affected with pernicious anemia the blood of my first patient with Vaquez's disease, without, however, obtaining the least improvement in the number of erythrocytes.

Nor was there more success with the theory based on a presumed diminished capacity of the red corpuscles to take up oxygen, following which the increase in the number of erythrocytes would be a compensating phenomenon. While this has been verified according to the theory of Arcangeli in the mechanism of cyanosis in congenital valvular heart disease, it has not been demonstrated in Vaquez's disease.

The rare occurrence of high percentages of erythrocytes in Addison's disease, in tetanus and in exophthalmic goiter more recently has given rise to a hypothesis that disturbances of an endocrine nature play a more or less noticeable part in the pathogenesis of polycythemia. Mansfeld, injecting thyroid extract, was able to provoke a polycythemia in dogs and rabbits that went as high as 8 million, while in thyroidectomized rabbits, which he transported to high altitudes, he did not find an increase in red corpuscles. According to the experiments of Asher and Dubois, a more or less marked anemia is found in the rabbits after thyroidectomy. If disturbances of an endocrine and sympathetic nature (vagotonic constitution of Pittaluga) are accompanied in some cases by polycythemia, they cannot, however, be held to be determinants of the disease itself.

CLINICAL AND PATHOLOGIC BASIS OF THE DISEASE

The bone marrow and the spleen with their alterations constitute the clinical and anatomicopathologic basis of the disease, and must be considered of primary importance in the pathogenesis of the disease itself. Although cases such as those of Osler, in which tumor of the spleen was not semiotically demonstrable, and of Cabot, in which splenomegaly is not spoken of, have been described, and while in the form reported by Gaisböck the spleen is little or not at all enlarged, in Vaquez's disease hypertrophy of the spleen is the rule.

The size of the tumor of the spleen varies, and while it may exceed the rib arch by two or three fingerbreadths, it may assume extraordinary dimensions, reaching at times to the iliac crest. Generally, the surface of the spleen presents a smooth appearance; the consistency is almost normal or slightly increased, and the spleen is little or not at all painful. In the rare autopsies, the surface, as well as sections of the spleen, was found to be smooth, with a coloring that varied from wine red to bluish. The organ is described as completely filled with blood, so that it constitutes a true blood reservoir; and there have been found great hemorrhagic cysts, infarcts and perisplenic alterations. The follicles were not generally recognizable.

The other element, which represents, as I have said, the anatomicopathologic pathogenic basis of Vaquez's disease—that is, the bone marrow—shows at autopsy alterations important for their value. Longitudinal section of the long bones shows them to be entirely filled with red marrow; only rarely have there been found islands of yellow fat marrow. The appearance has been described as resembling that of infantile marrow, and because of the intensely red color, the appearance of the marrow has been compared to that in pernicious anemia (Weber and Watson, Türk, Hirschfeld, Breur, Müller, Glassner, Blumenthal, Goldstein, Lammel, Eppinger). In cases in which autopsy has been done, red transformation of the bone marrow has been a constant finding with evident signs of functional

hyperactivity, a transformation and hyperactivity which represent the anatomicopathologic basis of polycythemia.

TREATMENT

The first attempts to cure the disease were those which sought in some way to diminish the blood volume. The patients were placed under restricted and debilitating dietary regimens, undergoing actual hunger cures, and about the same time repeated venesections, more or less abundant, were made.

Treatment by repeated venesection is based on a mistaken concept that some still hold efficacious. It is to be rejected absolutely, not only as useless but as harmful. In fact, it is an elementary and indisputable principle of pathology that repeated venesections end by constituting a stimulus of the hematopoietic centers, tending to reestablish and maintain blood equilibrium.

Surgical treatment, represented by splenectomy, is based on mistaken pathogenic ideas of the disease, and has been shown to be useless. Today it is unanimously condemned.

Chauffard and Troisier obtained a temporary diminution of polycythemia in one case by using sodium citrate. Arsenic and mercurial preparations, and benzene, were also abandoned because they were without effect. Recently, Rosenfeld gave a series of injections of thorium X, obtaining only slight success.

In consequence of the efficacy of the treatment of leukemia with roentgen rays, the same method was suggested in Vaquez's disease. The therapy was applied directly and exclusively to the spleen, and in 1904 Vaquez spoke of this treatment in a case of splenomegalic polycythemia as being without benefit. Other times, as in the cases of Begg and of Lutembacher, the treatment resulted in an increase in the number of erythrocytes. In the classic publication of Gaisböck in 1905, a patient is described whose spleen was irradiated without results. The outcome of successive attempts was always the same, so that Pancoast in 1908 said that roentgen therapy of polycythemia did not give encouraging results.

Notwithstanding this, some authors continued to subject their patients to roentgen therapy of the spleen. Bottner in 1909 reported a case of the Vaquez type in which twenty-nine irradiations were given without any effect either on the spleen or in the appearance of the blood. Kuttner in 1912 mentions having treated a patient with the polycythemia of Vaquez by means of irradiations of the spleen without noticeable or permanent results.

Pick, in 1913, treated a patient who had 9,000,000 red corpuscles and a tumor of the spleen. He states that, after irradiation of the spleen, the number of red corpuscles went down to 8,000,000 but after a short time reached again a high figure.

Moeves, in 1913, treated a case of Vaquez's polycythemia with eight irradiations of the spleen. He obtained diminution of the splenomegaly, but the benefit did not continue and the number of red corpuscles underwent only a slight and temporary decrease. Strauss, in 1920, stated that he never observed effects after treatment of the spleen, but he did not cite cases.

Ward[1] of the Rigshospital, in 1919, reported three cases. In one the patient underwent therapeutic roentgen treatment of the spleen from Nov. 29, 1919, to Nov. 1, 1920. Subjectively there was a temporary improvement and the pain in the splenic region disappeared, but the appearance of the blood was only temporarily modified. Another patient was irradiated from July 14, 1920, to April 7, 1921. In this patient, also, Ward noted a slight decrease in the red corpuscles which was only temporary, and an improvement which likewise was only temporary.

The third patient of Ward's is the only one who, it appears, received a slight benefit from the cure, as the red corpuscles diminished. This does not seem, however, to be an applicable or demonstrative case since, besides the splenomegaly, the polycythemia and the high coloring of the face, symptoms were present which do not form part of the classic picture of Vaquez's disease. In fact, the patient had abdominal pains that began suddenly, were of a colicky nature and were followed by jaundice; she had diarrhea, and a localized peritonitis was also found. She showed also disturbances of a lower limb; that is, sudden cold, pallor and insensitivity. The author states that the cutaneous reaction to tuberculin was slightly positive, and the tuberculous heredity of the patient was highly positive, as the father and a sister died of tuberculosis. In both my cases, however, as in those just mentioned and described by Popper, Preiss and Weber, the skin reaction to tuberculin was negative.

It is apparent that roentgen therapy of the spleen in Vaquez's disease has been a complete failure. Attention was next turned to the marrow of the bone, but the investigators advised irradiating all bones in general without specifying any in particular. Results were thus obtained that were encouraging; that is, the decrease in the number of red corpuscles was more marked and lasted longer. Lüdin in one case obtained thereby a decrease in the red corpuscles from 7,000,000 to 5,000,000 and in the leukocytes of from 11,000 to 4,000. In two other cases he obtained similar good results. He irradiated systematically almost all the bones with rays filtered through 3 or 4 mm. of aluminum. Solomon, in two cases of the polycythemia of Vaquez, obtained a decrease in the red corpuscles from 11,000,000 to 6,000,000. Max Steiger also had good results from irradiation of the bones.

REPORT OF CASES

I had the opportunity of studying and following two classic cases of Vaquez's disease, which I treated by means of roentgen irradiation of the bones, obtaining, as will be seen, excellent and lasting results.

CASE 1.—I had occasion to observe this case about six years ago in the Tenth Department of the Policlinico of Rome, and I reported it at the Congress of Internal Medicine held in Rome.[2]

History.—A woman, aged 30, unmarried, gave a family history that did not reveal anything of importance; tuberculosis was carefully excluded. A brother (an army physician), without previous illness, died suddenly during the night, and it was not possible to ascertain the cause of his death. In the remote personal history of the patient there appeared measles without complications, and slight bronchial disorders, quickly and completely cured.

The beginning of the present disease went back to about eight years before, when the patient began to notice that the coloring of the skin of her face and of the mucous membranes was becoming intensely red, especially after physical and intellectual overexertion. There followed progressively intense headache, which prevented sleep, lasting for four or five days, and repeated with the same intensity at irregular intervals. To relieve these headaches, which no treatment could control and which were accompanied by nausea, vomiting and loss of appe-

1. Ward: Acta radiol., part 3, **11**: 23, 1919.

2. Milani, Guido: Acts of Thirty-First Congress, Oct. 26-29, 1925.

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tite, recourse was had to morphine, in doses up to 0.03 Gm. a day, with some improvement. Frequent attacks of palpitation disturbed the patient, who felt also diffuse pains in the limbs, both upper and lower, but especially in the lower.

Whereas previously the patient had been of a tranquil disposition, she now became restless, quick to anger and excitable, irascible both with relations and with others who came in contact with her. Before her illness she busied herself with the affairs of the family estate, whose accounts she kept; during her illness she was obliged to abandon all work because she forgot easily, was quickly tired and, above all, because mental effort, even of the slightest sort, caused the headache to return and produced syncope. She felt waves of heat pass over her face, which had assumed an intense red coloring; the mucous membranes of the lips and gums had become violet red and bled easily; constipation was present, and menstruation was scarce and irregular. This was the condition of the patient when I saw her for the first time.

Examination.—The physical examination showed a fair general condition and state of nutrition. The face was purplish red, with numerous dilated blood vessels; the lips and gums were red tending to bluish, and bleeding easily; the tongue was moist and coated.

The pulse beat was 80, equal, and rhythmic. The pressure, taken over the radial artery with Pachon's oscillometer, was normal. In the neck there was noticeable a moderate hypertrophy of the thyroid, but no ganglions in the laterocervical region.

The diameters of the heart were normal. The sounds on auscultation were clear and slightly reinforced at the apex of the heart.

The spleen was enlarged. Its upper boundary reached the eighth rib; the lower margin was felt three fingerbreadths beyond the arch of the rib; its surface was smooth; its consistency increased, not painful.

The liver was in its normal boundaries.

In both the lower limbs, extensive varicose veins were noted in the region of the internal saphena. Examination of the nervous system was negative.

The Wassermann reaction was negative. The skin reaction to tuberculin was also negative.

Examination of the urine was negative.

Examination of the blood showed: red corpuscles by the Thoma Zeiss method, 12,000,000; white corpuscles, 12,000; hemoglobin by the Fleisch method, 120 per cent; neutrophils, 86; large mononuclears, 3; lymphocytes, 10, and eosinophils, 2.

Microscopic examination of slides prepared with the Gimesa stain showed a slight poikilocytosis, and rare nucleated red corpuscles.

Treatment and Course.—With the patient in this condition roentgen therapy was begun, and from March 5, 1923, to February, 1924, five irradiations were applied on the sternum divided into three sections, and on the vertebral column divided into five sections.

A symmetric apparatus was used, with a tube known by the trade name SHS. A skin erythema dose of from 38 to 40 per cent was used and the irradiations lasted eighteen minutes in each region. The filter was a combined filter consisting of 0.5 mm. of zinc and 1 mm. of aluminum. During the treatment the red corpuscles decreased to 8,072,000 in June, 1923, i. e. after the third irradiation, and diminished again to 7,600,000 after the fourth. But a month after the last irradiation, that is, March 20, 1924, they had again increased to 12,000,000.

The patient again felt some disturbances that had diminished when the red corpuscles had diminished; i. e., headache, dizziness and palpitations. Therefore, March 21, 1924, a new series of irradiations was begun, but this time the irradiations were no longer applied to the flat bones but to the tubular ones. From March 21, 1924, to March 17, 1925, seven irradiations of fifteen minutes each were applied to the tibias, to the femurs, and to the elbows, checked always by a count of the corpuscles. After the second irradiation, March 30, 1924, the red corpuscles decreased to 8,000,000, and they remained around this number. After the sixth irradiation, in April, 1925, they decreased to 6,540,000. The white corpuscles, which during the treatment had increased to 10,000, decreased also to 5,000.

She returned to me in June, declaring that she felt very well and that she had not followed any special diet. The blood was examined and showed 6,030,000 red corpuscles, 6,200 leukocytes, and 110 per cent hemoglobin.

A microscopic examination of slides showed an absence of morphologic changes in the red corpuscles and an absence of nucleated red corpuscles. Neutrophils were 81 per cent; eosinophils, 4, lymphocytes, 13, and large mononuclears and transitionals, 2.

The upper limit of the spleen was in its normal bounds; the lower margin was barely felt in deep breathing.

In November of that year I had the opportunity of seeing the patient again. The quantity of erythrocytes was almost unchanged (6,400,000 red corpuscles).

With the decrease in the number of red corpuscles and of the volume of the spleen, the original appearance of the patient also changed, i. e., her coloring became much less intense, and the lips and gums no longer bled; today, in fact, the appearance of the patient does not deviate from the normal.

The subjective phenomena also began to diminish, both in intensity and in frequency, with the progress of the irradiation; first of all the headache disappeared, so that the patient was able to abandon morphine immediately, escaping the drug habit. The easy irritability that rendered relationship with people impossible disappeared, and a sense of tranquility returned.

Gradually she was able to return to her work and to reassume the direction of the family estate, keeping all the accounts and undergoing heavy physical and intellectual exertion without any disturbances.

CASE 2.—This case came under my observation about a year ago during my service in the Istituto di Patologia Medica Speciale of the University of Rome.

History.—A government clerk, aged 55, married, with two children, both of whom were living and well, and with a negative family history, declared that he had always been in good health.

According to the patient, the first signs of the illness began in 1902, at which time he began to suffer heaviness of the head; at irregular intervals he had various severe attacks of headache. The headaches were especially intense in the frontal and occipital regions. Dizziness often accompanied the headache. The patient had the sensation of objects swimming about him, and when he walked through the streets it seemed to him as if the buildings tended to fall, so that often he was obliged to stop, lean against something, or sit down. His gums bled easily and copiously and he noted also cutaneous hemorrhages. A physician who had had occasion to see him had observed a large tumor of the spleen.

For the past three years the attacks of headache had increased. He complained also of a buzzing in the ears, frequent hot flushes across the face, and from time to time cardiac palpitation. For the past two years he had complained of a noticeable weakness of the lower limbs, with often muscular cramps in the legs, and lumbar and osseous pains. His nature had changed; whereas formerly he had been a tranquil man, he had now become extremely irritable and restless.

About nine months prior to the time when he appeared for treatment, the patient had been observed by another physician, who found about 12,000,000 red corpuscles, for which the patient had been sent to a roentgen therapy clinic. Here the patient was given irradiation of the sternum, the iliac bone and the ribs for a long period of time. From the examination of the blood made after treatment, it was seen that the red corpuscles had not diminished, while all the other disturbances persisted.

Another physician had made seven venesections, taking at each venesection 300 cc. of blood, from which treatment the patient received no benefit, his condition remaining unchanged. He then presented himself at the institute for observation.

Examination.—Physical examination showed a good general condition and state of nutrition. There was high coloring of the face; the visible mucous membranes were red tending to bluish; the sclerae were bloodshot. The tongue was moist and coated. The pulse was rhythmic, regular and of equal frequency. The systolic pressure was 155; the diastolic pressure 90.

The heart was within its normal limits; the second aortic sound was slightly reinforced.

The lower border of the liver was felt one finger below the arch of the ribs; the upper border was within normal boundaries.

The spleen was noticeably enlarged in volume and increased in consistency, but was not tender on palpation. The upper boundary of the spleen was level with the seventh rib; the lower boundary reached the iliac crest.

The Wassermann reaction was negative.

The specific gravity of the urine was 1.016; albumin was present. Dextrose, acetone bodies and biliary pigment were absent. There were traces of urobilin. The chlorides were 8.50 per thousand; the phosphates, 2.30 per thousand.

Microscopic examination showed some red corpuscles and rare leukocytes. Epithelia cells and uric acid crystals were present.

Examination of the blood, Jan. 10, 1927, showed an average count of the capillary blood of 11,200,000; the average count of the venous blood was 12,000,000. White corpuscles numbered 9,400; polymorphonuclear neutrophils, 77 per cent; lymphocytes, 11 per cent; monocytes, 5 per cent; basophils, 6 and platelets, 290,000: Morphologic examination of the slides stained by a Grunwald-Giemsa preparation showed slight anisocytosis and poikilocytosis. Some normoblasts, orthochromatic, with a pyknotic nucleus, and other normoblasts, polychromatophilic, with initial pyknotic reduction of the nucleus, were noted.

Immature forms of leukocytes not found.

The total viscosity of the blood, determined by the method of viscosimetry devised by Hess, was 9.8.

The viscosity of the serum was normal.

Corpuscular resistance had its limit in the concentration of sodium chloride at 0.32 per cent. The minimum resistance had its limit at 0.48 per cent of sodium chloride.

Treatment and Course.—With the patient in this condition, roentgen therapy was begun as follows: The skin erythema dose was 40 per cent. A tube with a port opening of 6 by 8 cm. was used. The milliamperage was 2. The filter was a combined filter consisting of 3 mm. of aluminum and 0.5 mm. of zinc. Beginning Feb. 15, 1927, and ending June 20, 1927, thirty-eight irradiations were made, of seventeen minutes' duration for each region, checked by blood counts. These irradiations were applied first to the bones of the upper limbs and then to those of the lower limbs. After the first irradiations, February 17, the red corpuscles descended to 11,500,000; March 5, to 9,000,000 and, May 5, to 6,100,000. October 15, three months after the last application, the red corpuscles were 4,200,000.

COMMENT

From the cases referred to in the literature and from my experience in these two cases, I feel justified in concluding that roentgen therapy represents the most efficacious and the most certain means for the cure of Vaquez's disease, and, when it is well applied and regulated, and accurately supervised, gives brilliant and lasting results, arresting the fatal evolution of the disease.

Only time and experience will tell how long the state of well being of these patients will last. Some months ago my first patient stated that the number of red corpuscles was about 5,000,000 and that she was in good health. Three years has passed since the last irradiation.

As to the organs that must be irradiated, it is apparent that irradiations of the spleen have not given favorable results, though repeatedly tried.

Irradiation of the flat bones will sometimes result in a slight improvement, which, however, is transient.

In fact, in my first patient, after roentgen therapy of the sternum and of the vertebral column, a slight improvement was noticed, both in the number of red corpuscles and in the general condition; but after a short time the red corpuscles increased again and the condition of the patient became the same as before.

In my second patient, roentgen therapy of the flat bones did not result in any improvement.

When, on the other hand, the irradiations were applied to the long bones, the number of red corpuscles decreased to normal; the spleen returned to its physiologic limits; the high red coloring of the face diminished and the hemorrhages disappeared, as did all the other subjective secondary symptoms.

The happy outcome of this therapy brings a clinical contribution of great value to the pathogenesis of this disease, because it shows clearly that the element responsible in the hematologic and clinical picture of the disease is the marrow of the long bones, on which the unknown etiologic factor acts almost exclusively, and it indicates the method to be followed in the treatment of polycythemia.

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PROTEIN DIGESTION IN INFANCY*

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It is difficult to suppose that an effective protein digestion in the gastro-intestinal tract can take place only within the range of the optimal reaction for the activity of the digestive ferments. The p_H of the gastric and intestinal contents often has been found to differ widely from the optimum. In regard to gastric digestion, Davidsohn, Salge and others, who did their work twenty years ago, found a low hydrogen ion concentration in the stomachs of infants and therefore denied the existence of any intensive peptic digestion in infancy. There are many others sharing this opinion, although there can be no doubt that even in earliest infancy hydrochloric acid and pepsin can be produced.

The buffer qualities of milk are said to lessen or even to prevent entirely the production of a sufficient degree of acidity, at least during a considerable part of the period of gastric digestion. During this time, gastric contents may pass into the intestine practically unaltered by digestion, as far as protein digestion is concerned. Values of p_H 3 are not reached at all by many breast-fed infants during the first months of life and the first two hours after feeding. At p_H 3 the activity of pepsin amounts to only one tenth of its maximum, according to the most frequently quoted measurements of Sörensen and Northrop.

Later, I stated that also in the small intestine conditions for protein digestion are not entirely favorable. Neither in infancy nor in adult life is the reaction decidedly alkaline, a condition necessary for the full activity of trypsin or of erepsin; it remains on the acid side. Only in the most distal parts of the ileum is a neutral reaction nearly reached. The optimum of trypsin is at approximately p_H 8. In the zone of hydrogen ion concentration of the small intestine, ranging from p_H 4.5 to p_H 6.5, there is a marked decrease in the activity of trypsin down to the zero point. This holds true also for the peptidases. If, then, it is correct that there can be no intensive peptic digestion in early infancy, the question arises as to whether any complete digestion of proteins in infancy is at all likely to take place.

* Read before the Section on Diseases of Children at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

As for the intestinal digestion, Heller has shown that the presence of bile is favorable to trypsin by widening the range of activity on the acid side. But this effect is caused, as I have found, by an increased production of peptones and not of amino-acids. The difficulties of a complete splitting of proteins in the intestines are therefore not lessened by this process. However, it has been demonstrated by different methods that a good peptic digestion takes place in infants' stomachs notwithstanding theoretical objections (R. Hess, Rosenbaum, Schiff-Mosse, Budde). In human milk, the disintegration of protein by gastric digestion is less than in cow's milk. The apparent contradiction between the actual observations and the theory is fully explained by the fact that the activity curves of pepsin on various proteins were studied but never those of milk itself. According to the work of Budde with milk, the curve follows a somewhat different course than with acid albumin. The latter curve of splitting lies lower than that of milk when the same ranges of p_H are compared. Cow's milk protein is better decomposed by pepsin than is a solution of albumin. Also, the degree of splitting falls much more rapidly with albumin than with cow's milk or with casein solutions when the acidity is reduced. The decomposition of these protein substances at p_H 3.2 has been found to be 85 per cent and of the albumin solution less than 50 per cent of the maximum obtained at p_H 2. Even at p_H 5 to 6, the value with milk is not quite zero. Even there, a slight decomposition takes place.

Furthermore, it must be said that a pointed optimum of pepsin at p_H 1.5 to 2.3 can be detected only if the rate of decomposition is large and if the duration of the experiments is so long that it cannot be compared with physiologic conditions. The fact that marked peptic digestion may occur in vivo on a milk diet at gastric acidities which are not less than p_H 4 to 5 is therefore not in contradiction to the chemistry of ferments.

I was able to establish the explanation for this by in vitro experiments. Artificial preparations of pepsin as well as the natural gastric juices of infants split the protein of cow's milk better than that of human milk, even if diluted to the same percentage of protein. Pepsin has a strong effect on casein under identical experimental conditions and not as good an effect on the albumin of eggs or of milk. The high albumin content of human milk renders its protein less digestible in the stomach than that of cow's milk.

I next proceeded to ascertain whether there are the same differences between human and cow's milk regarding tryptic digestion. I used the following methods: the titration of the carboxyl groups in alcoholic solution according to Willstaetter; the increase of nonprotein nitrogen during digestion, and viscosimetry and the transformation of caseinogen into casein—that is, the rennet effect of trypsin. It is evident that quite different stages of digestion are dealt with by these methods. The titration method of Willstaetter measures the last steps of protein decomposition, while the rennet effect indicates the slightest first alterations in the process. The intermediate stages of digestion are characterized by the lowering of the viscosity, as a result of the decrease of the protein content, and by the increase of nonprotein nitrogen. The latter occurs much more quickly than the increase in the amino-acids. As all four methods are applied to different stages of tryptic digestion, and yet give practically the same results, much more weight is to be put on the observations. The protein of human milk is less susceptible to tryptic action than that of cow's milk. In the same way, as shown for pepsin, I found that casein is more easily digestible by trypsin than is albumin. The albumin if added to a casein solution even produces a marked checking in the decomposition of casein. Because of its higher content of albumin, therefore, human milk is less digestible by trypsin than is cow's milk.

A relatively strong resistance to digestion is exhibited also by the colostrum, a fact which strengthens to a certain extent the doctrine that by this fluid immune bodies are transferred from the mother to the child.

Globulin, chiefly euglobulin, is split better than albumin but not as well as casein, when the process is compared under similar conditions.

Of a certain practical value is the fact that cooking renders the protein of milk more digestible by trypsin. Cooking destroys the preventive action of the albumin on the tryptic digestion of casein. In proportion to its higher albumin content, the improvement of tryptic action by cooking is more marked in human than in cow's milk. Heating to only 60 C. (140 F.) for an hour gives the same result as cooking for ten minutes.

The work of American pediatricians (Brenneman, Talbot, Southworth, Schloss and others) has shown that rennet curd formation from raw cow's milk hinders absorption, a fact later confirmed in Europe, where the use of raw milk, however, has been rather uncommon. The lessened susceptibility to tryptic action is therefore another disadvantage of raw milk. It should be pointed out, however, that the second defect is to some extent compensated for by the first, as coagulation separates the casein from the albumin, thereby eliminating the preventive action of albumin on the following tryptic digestion of casein.

On the other hand, it cannot be assumed that the same process of rennet curdling gives better conditions in vivo for the tryptic digestion of human milk. The coagulation of human milk by rennet follows other rules than that of cow's milk. First of all it starts at about p_H 6 and has its optimum at approximately p_H 5, as compared with 6.4 for cow's milk. Therefore, there is a greater chance for human milk to pass uncurdled into the intestine than there is for cow's milk. Furthermore, I have found that the action of lipase, contained in human milk and acting on the stomach contents, checks the rennet coagulation by binding the free calcium ions, indispensable for rennet action, into calcium soaps. Therefore, it can no longer be doubted that the protein of human milk is less digestible than that of cow's milk.

The better digestibility of casein has been made use of for a long time in the practice of infant feeding. When it is desirable to enrich an infant's food in its protein content, casein or its derivatives have always been preferred as, for example, in the Finkelstein protein milk. The use of albumin preparations does not seem to give the same good results. Infants' foods rich in casein have the well known characteristics of producing alkaline dejections or even calcium soap stools. This is the result of an increase in intestinal secretions due to the products of protein splitting acting as secretory stimuli. Neither these secretions nor the changes in the character of the stool are essential to recovery from conditions for which the protein milk

was used. In the same way, it is not likely that the metabolic products of casein splitting could check the growth of *Bacillus coli* in the small intestine; on the contrary, they enhance it. The accepted superiority of foods such as protein milk is really due to the good conditions for absorption and assimilation of protein offered in this form.

It might be expected that, in view of the low susceptibility of the proteins of human milk to the action of gastric and intestinal ferments, human milk would not be at all useful in the treatment of dyspeptic conditions. And, indeed, there are some pediatricians who reject human milk especially in the treatment of severe cases of dyspepsia, at least during the first days. My own experience is not in agreement with this opinion. I have had very good results while using human milk in cases of severe diarrhea, though not, however, in the stage of intoxication, and I do not think that the more difficult digestibility of the proteins of this milk harms the intestine in any way.

These statements raise the question of the ultimate fate of human milk albumin in digestion. Researchs on nitrogen balance have shown that there is good utilization of the proteins of human milk and that they are without doubt well absorbed. Therefore it is likely that at least a part of human milk albumin may pass through the intestinal wall unsplit. I do not know what finally happens to such a protein. No harm can come from the absorption of an homologous protein. A breakdown of protein beyond the intestinal wall does not seem to be quite impossible and must be presupposed for any utilization in metabolism, because proteins do not permeate cell membranes. However, if undigested protein of cow's milk is absorbed, some allergic or anaphylactic reactions must be expected under certain conditions. The investigations here reported are in full agreement with those of Kleinschmidt, who found that under such conditions the albumin substances of whey are better antigens than is casein.

It is also known that the ability to pass the intestinal wall is an attribute more of substances of the albumin type, such as egg or serum albumin, than of other proteins. Uncooked serum albumin is wholly unassailable by trypsin; raw egg albumin is affected only to a very moderate degree. Substances less easily digestible are more likely to pass into the blood than a substance better digestible. One can understand how prolonged cooking of milk distinctly diminishes the possibility of producing sensitization by the oral route. By such cooking the albumins are coagulated more or less completely and can no longer permeate the intestinal wall. Furthermore, the chemical breakdown in this colloidal state happens more easily. Of course, I do not recommend prolonged cooking of milk for this reason. On the other hand, the production of allergic or anaphylactic phenomena is much more likely if raw cow's milk is used.

Such processes do not play a definite rôle in the common diarrheas of infancy. Is it, however, possible that the retardation of the digestion of albumins of cow's milk injures the intestine itself in some way? As any delay in the splitting and in the absorption of foodstuffs favors the growth of bacteria in the intestine, rather unfavorable effects of such a retardation should be looked for. The adherents to the principle of the reduction of whey in infant feeding may have their views strengthened by the facts to which I have here referred.

Finally, I think that the facts presented here are not without some importance. Nature itself gives suggestions. Animal milks, rich in protein, have a fair amount of casein and only milks with a lower protein content, such as human milk or that of horses or asses, have a relatively high content of albumin. In all cases in which there are greater demands for proteins digestion by the suckling young, casein is offered as the protein that is most easily split and readily absorbed.

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THE INFLUENCE OF INORGANIC ELEMENTS ON BLOOD REGENERATION IN NUTRITIONAL ANEMIA *

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The older textbooks on therapeutics [1] list a number of inorganic elements, in addition to iron, which are reputed to be of value in the treatment of anemia. Among these arsenic stands out most prominently, although reference may also be found to the use of salts of manganese, copper, mercury and vanadium. With a clearer appreciation of some of the factors underlying the anemias, the use of this form of therapy has fallen somewhat into disrepute, efforts being devoted more to the use of diets tending to promote the formation of hemoglobin. The work done by Whipple [2] stands out most prominently in this connection and it paved the way for the discovery by Minot [3] of the specific value of liver in the treatment of pernicious anemia.

The advance that has occurred recently in our methods of treating the anemias is due directly or indirectly in large part to the employment of animal experimentation, although morphologic studies have given us a better appreciation of the factors underlying the various forms of anemia. From this work it is clear that pernicious anemia would not be benefited by a mode of treatment that would be helpful in certain forms of secondary anemia. The lack of recognition of the fundamental differences between primary and secondary anemia on the part of many clinicians has no doubt had much to do with the differences of opinion that have existed regarding the value of certain therapeutic agents.

In his experimental work, Whipple has employed the dog and produced anemia by repeated bleedings. He has been particularly interested in the total amount of hemoglobin regeneration under various dietary and other conditions, and for this work the dog has served excellently. It was recognized many years ago by von Bunge that milk is deficient in iron and on this basis nutritional anemia has recently been produced in rats

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1. In Hare, H. A.: Practical Therapeutics, ed. 11, 1905, all of these except vanadium are mentioned.

2. Whipple, G. H.: Experimental Anemias, Diet Factors and Related Pathologic Changes of Human Anemias, J. A. M. A. **91**: 863 (Sept. 22) 1928. The subject is excellently reviewed in this paper, presented a year ago.

3. Minot, G. R., and Murphy, W. P.: The Treatment of Pernicious Anemia by a Special Diet, J. A. M. A. **87**: 470 (Aug. 14) 1926.

by Mitchell [4] and in rabbits by Hart and Steenbock.[5] Mitchell and her co-workers used the nutritional anemia of the rat as a means of comparing the therapeutic value of iron from various sources. Among other things the fact that inorganic iron, such, for example, as ferric chloride, may be readily utilized in hemoglobin building was clearly demonstrated. Subsequently Hart, Steenbock and their co-workers,[6] following the lead of Mitchell, carried out studies on the rat, after having somewhat simplified the technic of producing the nutritional anemia. A year ago they reported a series of observations on the rat in which they pointed out that pure iron in minimal amounts (0.5 mg. per rat daily) was inadequate to bring about hemoglobin regeneration, but that regeneration rapidly took place on the addition of a small amount of copper (0.05 mg. per rat daily). They were apparently unaware that copper had been used therapeutically in this connection. Although much impressed by the clear-cut experiments of Hart, Steenbock and their co-workers, it did not seem to us that copper necessarily played the unique rôle in hemoglobin metabolism which their conclusions implied. Almost simultaneously somewhat similar experiments were reported by McHargue, Healy and Hill,[7] and they stated that they were conducting further experiments on the effect of copper, manganese and zinc.

The work of Hammett, Müller and their co-workers [8] on germanium dioxide, carried out a few years ago, at once came to mind. Confirmatory studies on germanium had been carried out in the laboratory of one of us (V. C. M.[9]) and we felt that germanium might well show an action similar to that found for copper. It should probably be pointed out that some of the most prominent workers in the field of anemia, namely, Minot,[10] Bunting [11] and Whipple,[12] disagreed with the conclusions of Hammett and Müller regarding germanium.

AUTHORS' EXPERIMENTS

The nutritional anemia of the rat presents many features analogous to certain forms of secondary anemia in man, and it was felt that a study of the therapeutic action of various inorganic elements as a supplement to iron in this anemia might help to demonstrate their value or lack of value as possible therapeutic agents. The technic employed in the present experiments was essentially that of Hart and Steenbock.[6] Young rats were placed on a diet of whole milk for six weeks after weaning. When the erythrocyte count was about 3 to 4 million per cubic millimeter and the hemoglobin content 3 to 4 Gm. per hundred cubic centimeters, additions of various supplements [13] were made daily to the milk.

We have been able to show that germanium possesses much the same supplementing action to iron as that already demonstrated for copper. While our work was in progress a paper appeared by Titus, Cave and Hughes [14] in which they called attention to a similar supplementing action on the part of manganese and concluded that manganese and copper together were better as a supplement to iron than either element alone.

Atomic Numbers and Elements Reputed to Have Erythropoietic Action

Atomic Number	Element	Elements Recommended Therapeutically (So Far as Known)	Erythropoietic Action Observed in Nutritional Anemia of Rat (When Added to 0.5 Mg. of Iron Daily)
23	Vanadium	Yes	(Being tested)
24	Chromium	....	(Being tested)
25	Manganese	Yes	Marked 0.1 mg.
26	Iron	Yes	Marked 0.5 to 2.0 mg.
27	Cobalt	....	Slight 0.05 to 0.5 mg.
28	Nickel	....	Marked 0.05 mg.
29	Copper	Yes	Marked 0.05 mg.
30	Zinc	....	Good 0.5 to 0.1 mg.
31	Gallium	....	(Not tested)
32	Germanium	Yes	Marked 0.05 to 0.5 mg.
33	Arsenic	Yes	Marked 0.1 mg.
34	Selenium	....	(Being tested)
80	Mercury	Yes	(Being tested)

After we had observed a similar supplementing action on the part of both copper and germanium, it seemed desirable to study further elements which had had some therapeutic vogue or were related chemically. Observations have been made on arsenic, manganese, nickel and cobalt, the first three of which appear to supplement iron quite as well as copper or germanium. The results of these experiments are presented graphically in the accompanying chart. A number of other elements are being investigated.[15]

After having noted the erythropoietic action on the part of nickel and copper, manganese and iron, arsenic and germanium, we recalled that Müller was attracted to the study of germanium in this connection on account of the fact that it is adjacent to arsenic in the periodic system. Although we were aware that the atomic numbers of these elements stood close to each other, we were somewhat surprised at the results. All the elements reputed to be of therapeutic value in anemia are close to iron and arsenic in the series, except mercury, as shown in the accompanying tabulation, and it should be borne in mind that mercury was originally recommended in the treatment of syphilitic anemia.

4. Mitchell, Helen S., and Schmidt, Lola: The Relation of Iron from Various Sources to Nutritional Anemia, J. Biol. Chem. **70:** 471 (Oct.) 1926. Mitchell, H. S., and Vaughn, Margery: The Relation of Inorganic Iron to Nutritional Anemia, ibid. **75:** 123 (Oct.) 1927.

5. Hart, E. B.; Steenbock, Harry; Elvehjem, C. A., and Waddell, J.: Iron in Nutrition: I. Nutritional Anemia on Whole Milk Diets and the Utilization of Inorganic Iron in Hemoglobin Building, J. Biol. Chem. **65:** 67 (Aug.) 1925.

6. Waddell, J.; Steenbock, Harry; Elvehjem, C. A., and Hart, E. B.: Iron in Nutrition: V. The Availability of the Rat for Studies in Anemia, J. Biol. Chem. **77:** 769 (May) 1928. Hart, E. B.; Steenbock, Harry; Waddell, J., and Elvehjem, C. A.: Iron in Nutrition: VII. Copper as a Supplement to Iron for Hemoglobin Building in the Rat, ibid. **77:** 797 (May) 1928.

7. McHargue, J. S.; Healy, D. J., and Hill, E. S.: The Relation of Copper to the Hemoglobin Content of Rat Blood: Preliminary Report, J. Biol. Chem. **78:** 637 (Aug.) 1928.

8. Hammett, F. S.; Nowrey, J. E., Jr., and Müller, J. H.: The Erythropoietic Action of Germanium Dioxide, J. Exper. Med. **35:** 173 (Feb.) 1922. Hammett, F. S., and Nowrey, J. E., Jr.: The Erythropoietic Action of Germanium Dioxide in the Albino Rat, ibid. **35:** 507 (April) 1922. Müller, J. H., and Izzard, M. S.: Erythropoietic Action, Cumulative Effect and Elimination of Germanium Dioxide, Am. J. M. Sc. **163:** 364 (March) 1922.

9. Kast, L.; Croll, H. M., and Schmitz, H. W.: The Therapeutic Use of Germanium Dioxide in Anemia, J. Lab. & Clin. Med. **7:** 643 (Aug.) 1922. Schmitz, H. W.: The Value of Germanium Dioxide as a Therapeutic Agent in the Anemias of Childhood, ibid. **9:** 374 (March) 1924. Dr. Rosaline M. Parr (personal communication to the authors) has recently confirmed the erythropoietic action of germanium on the rat and man.

10. Minot, G. R., and Sampson, J. J.: Germanium Dioxide as a Remedy for Anemia, Boston M. & S. J. **189:** 629 (Nov. 1) 1923.

11. Bailey, G. H.; Davidson, P. B., and Bunting, C. H.: The Effect of Germanium Dioxide on the Rabbit, J. A. M. A. **74:** 1722 (June 6) 1925.

12. Whipple, G. H., and Robscheit-Robbins, F. S.: Blood Regeneration in Severe Anemia: III. Iron Reaction Favorable—Arsenic and Germanium Dioxide Almost Inert, Am. J. Physiol. **72:** 419 (May) 1925.

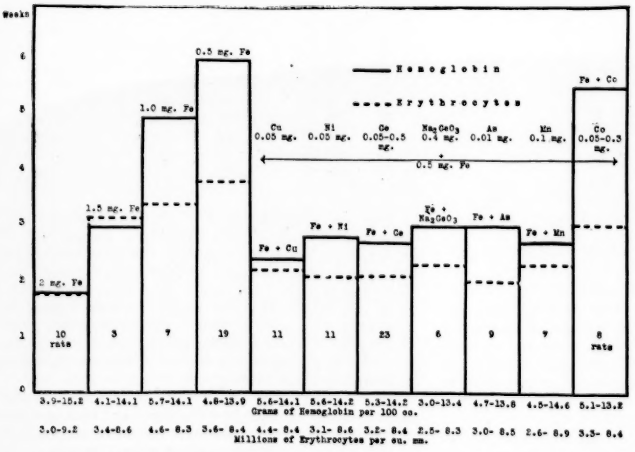
13. Our standard iron wire was obtained from the J. T. Baker Chemical Company. It was stated to be at least 99.8 per cent pure, and according to a report which they furnished was contaminated with 0.0018 per cent copper. This being the case, the 0.5 mg. of iron fed daily would contain 0.001 mg. of total impurities and approximately 0.0001 mg. of copper. According to the latest data of Hart, Steenbock and their co-workers (Elvehjem, C. A.; Steenbock, Harry; and Hart, E. B.: The Effect of Diet on the Copper Content of Milk, J. Biol. Chem. **83:** 27 [July] 1929; Waddell, J.; Steenbock, Harry; Elvehjem, C. A., and Hart, E. B.: Iron in Nutrition: IX. Further Proof that the Anemia Produced on Diets of Whole Milk and Iron is Due to a Deficiency of Copper, ibid. **83:** 251 [July] 1929), the 35 cc. of milk employed daily contains about 0.005 mg. copper, and the lowest effective dose of added copper is 0.0025 mg. In other words, milk contains twice the effective dose of added copper according to their own observations, and a much larger amount than could have been present in our added iron.

14. Titus, R. W.; Cave, H. W., and Hughes, J. S.: The Manganese-Copper-Iron Complex as a Factor in Hemoglobin Building, J. Biol. Chem. **80:** 565 (Dec.) 1928.

15. The details of this work are being reported elsewhere.

COMMENT

Our observations regarding the influence of iron alone on hemoglobin regeneration would appear to substantiate the observations of Mitchell [4] and the recent observations of Whipple [16] in this regard on the dog, rather than those of Hart and Steenbock,[17] who were unable to secure regeneration in the rat with 0.5 mg. of iron alone. However, the experiments of Hart and Steenbock appear very definite on this point and it is quite possible that the diet employed by us contained traces of elements (other than copper) in excess of those found in the diet employed by Hart and Steenbock. The experiments we have conducted dealing with the presence of copper in the iron used, the content of copper in the milk employed and the possible contamination in the cages would seem to exclude these as important sources of error. However, it is possible that the combined contamination of several elements may have led to the different results, or that our rats had sufficient of these elements stored in the liver during fetal life to enable them to utilize the iron, since Titus and Hughes [18] have shown that copper and manganese may be stored by young rats.



Hemoglobin and erythrocyte regeneration under the stimulus of iron alone, and iron plus other elements. Average weeks required for regeneration.

Although we wish to reserve a final decision on the action of iron alone, we feel that our experiments are entirely adequate to demonstrate the iron-supplementing action of a number of elements in addition to copper, and for this reason we do not believe that copper plays the unique rôle suggested by Hart and Steenbock in their publication.

SUMMARY

The experiments reported show that when growing rats have been rendered anemic by an exclusive milk diet, and 0.5 mg. of iron is given daily, traces of manganese, nickel, copper, germanium and arsenic all have a definite supplementing action on hemoglobin regeneration. All these elements, with the exception of nickel, have at some time in the past been recommended therapeutically in the treatment of anemia. The present observations are therefore in large measure an experimental verification of older clinical observations.

It is a singular fact that practically all the elements which appear to supplement iron in hemoglobin regeneration stand close to it in the list of numbers in the periodic system.

2109 Adelbert Road.

16. Elden, C. A.; Sperry, W. M.; Robscheit-Robbins, F. S., and Whipple, G. H.: Blood Regeneration in Severe Anemia: XIII. Influence of Certain Copper Salts upon Hemoglobin Output, J. Biol. Chem. **79**: 577 (Oct.) 1928.

17. Hart and Steenbock (footnote 6, second reference).

18. Titus, R. W., and Hughes, J. S.: The Storage of Manganese and Copper in the Animal Body and its Influence on Hemoglobin Building, J. Biol. Chem. **83**: 463 (Aug.) 1929.

ABSTRACT OF DISCUSSION

DR. ROGER S. HUBBARD, Clifton Springs, N. Y.: It is easy to understand that some constant source of error may be present throughout a series of experiments, so that the work of one man may differ from that of another, but it is difficult to see how an error can affect comparisons made by a single investigator using a constant technic. If the results of this comparison of the effect of one element with that of others are accepted, one of the interesting points suggested as a possible corollary of the early work on the use of copper in anemia becomes much less striking. When this work was presented it was suggested that in it might be indications of a relationship between those lower orders of animals which contain copper in their body fluids, and the higher ones which utilize combined iron. If many other elements can be substituted for copper and show an equal effect, it seems less probable that there is such a biologic significance to the results. Another suggestion that arises from the paper concerns the significance of different anemic conditions. The authors have pointed out how important the differentiation of primary from secondary anemia has been. They have also shown that anemia produced by repeated bleedings responds very differently to germanium oxide (as reported by Dr. Whipple) from the way in which nutritional anemia, as studied in their laboratory, responds to the same compound. It is certain that reports of the effects of different therapeutic agents contain many contradictions as striking as this. Is it not possible that in the heterogeneous group known as "secondary anemia" there are included conditions as diverse from each other as are the experimental conditions studied by Dr. Whipple and Dr. Myers, and that this fact may explain some of the variations in therapeutic results?

DR. HARRY STEENBOCK, Madison, Wis.: I wish I could enlighten this audience in regard to the cause of the discrepancies that exist in the work of Drs. Myers and Beard and that of Professors Hart, Waddell and myself. When we reported our work on copper more than a year ago, we had already carried out a great many experiments on nutritional anemia in the rat, and in all cases we found that copper was effective. Pure iron alone was not effective. Ordinary iron was effective, as obtained from the usual sources because of contamination with copper. Even iron obtained from the Bureau of Standards as pure iron was effective when fed in large amounts. We have repeated and continued our work. We have fed larger amounts of iron, up to 10 mg. a day, and have

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obtained absolutely no effect. We have fed practically all the elements that the authors presented in their chart to hundreds of animals, and in no case have we obtained any clean-cut effect except with copper. The only exception that we were forced to give any consideration to occurred in an animal given manganese. In that particular animal the regeneration of hemoglobin was very slow, and it never reached the peak of normal hemoglobin. We have, in addition, studied many other elements than those mentioned by the authors. With all of these we have failed to obtain any effect except with copper or with various preparations which were contaminated with copper. So far we have not as yet clearly demonstrated any clinical connection in the human being with these experimental types of anemia that we have been studying and which respond to copper therapy. We are fully cognizant of the various difficulties that enter into this type of work, and realize that it takes a host of workers in different laboratories who, by chance or intention, encounter various obstacles and, finally, solve them.

DR. VICTOR C. MYERS, Cleveland: I tried to make it clear that Dr. Hart and Dr. Steenbock's paper was very convincing, particularly with regard to the lack of hemoglobin regeneration on iron alone. We wish to reserve final judgment on this point, so far as our own experiments are concerned, but believe that our iron was sufficiently pure not to have been the source of difficulty. It is possible that the difference might have arisen from the milk we employed. We used certified milk at that time. Dr. Steenbock is much more fortunate in this connection, being in an agricultural school. At present we are having our milk collected in a crockery jar in the country, at once transferred to glass milk bottles, and brought to our laboratory. Here there is no question about the contamination of milk from mineral containers, but the results with iron alone have been the same. One thing to which I should like to call attention is the fact that people in different parts of the country apparently are not able to obtain the same results with the same type of experiment. I think I might be permitted to quote Dr. Hughes in this connection. Dr. Hughes informed me in a personal communication that when he and his co-workers obtained the iron supplementing action with manganese, they wrote to Dr. Hart and Dr. Steenbock, who were unable to confirm this observation with their own preparation of manganese or that furnished by Dr. Hughes, although Dr. Hughes and Dr. Titus obtained positive results with both preparations. Dr. Mitchell of Battle Creek obtained different results with iron alone than did Dr. Hart and Dr. Steenbock. Our results are in harmony with her work. It would seem possible that the geographic location might play a rôle in the experimental results obtained. I feel convinced about the action of germanium. Dr. Parr at the University of Illinois has recently carried out quite a large series of experiments in which she has obtained definite action with germanium. As shown in our chart, the results obtained with iron, plus copper, plus germanium, plus nickel, plus arsenic and plus manganese were essentially the same. I cannot see how one can come to any other conclusion than that these elements all have a supplementing action to iron. We have carried out experiments with a large number of other elements, and in general have obtained negative results.

The Problem of Prostatism.—The management of prostatism is and should always be essentially a problem of general practice. At least until surgical correction becomes a necessity there is nothing either in the armamentarium or in the experience of the urologist that offers an especial advantage to these old men. A gradual but very slow weakening of the urinary stream, with the usual slight day and night frequency, is best left entirely alone. Even to those with such slight prostatic enlargement, however, acute, complete retention of urine occasionally comes as the result of undue exposure or of forced overholding. This is by no means the disaster it may appear to be. After a few days of hot sitz baths, some internal alkaline diuretic, and gentle as well as quite frequent catheterization, these men usually find themselves much wiser but no worse for their experience.—Sargent, J. C.: Urological Problems in General Practice, *Wisconsin M. J.*, September, 1929.

DIET IN THE ETIOLOGY AND TREATMENT OF STERILITY*

DONALD MACOMBER, M.D.
BOSTON

During the last twenty years a large amount of evidence has been gathered to show the effect of diet on fertility. Up to the present time this evidence has been drawn almost entirely from experimental work on animals. What little work has been done in human beings has largely been lost sight of, at least by the medical profession. It is my purpose in this paper to review briefly the work on animals, though time and space must necessarily limit this survey, and then to present what evidence there is that the same forces are operative in human beings as in animals. This presentation of the human problem will include some controlled experimental work, some evidence of an historical nature showing the effect of famine on reproduction, and finally an analysis of the diets of 206 sterile women.

A scientific knowledge of the effect of diet on reproduction has developed only within the last fifteen or twenty years. Previous to that time a good deal was known in regard to the chemistry and digestion of foods, but it was only with the discovery of the accessory food substances, or vitamins, that it became possible to plan experimental diets in such a way that the effect of changes of any one element on reproduction could be determined. The first experiment designed to investigate reproduction on any large scale was carried out at the Wisconsin Experiment Station on cattle by Hart, Steenbock, Humphrey and McCollum.[1] This was reported in 1911 and showed what an enormous effect changes in diet could have on reproduction in the cow.

Since the publication of this important work our knowledge of the vitamins has been greatly extended and another means has been developed by which the reproduction of laboratory animals can be adequately checked, and which therefore has been extremely useful in controlling experiments along these lines. I refer to the development of the technic of examining the cell content of the vagina, by which knowledge can be obtained of the occurrence of estrus in certain laboratory animals, particularly the guinea-pig and the white rat. It is important to be able to recognize estrus, since in animals this period coincides with ovulation. In the larger animals estrus is easy to recognize both from the discharge of certain secretions from the vagina and from the behavior of the animals themselves, but in the rat no such evidence exists and this method of examining smears from the vagina, which was first developed by Stockard [2] and later by Long and Evans,[3] is absolutely essential if reproduction is to be studied in the laboratory. Having perfected this technic, Evans [4] has gone on to investigate the effect of changes in the diet on the regular occurrence of the estrous cycle. He has made a great many original observations which are of particular interest. He has found, for instance,

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* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

1. Hart, E. B.; Steenbock, Harry; Humphrey, G. C., and McCollum, E. V.: Research bull. 17, Wisconsin Experiment Station, 1911.
2. Stockard, C. R., and Papanicolaou, G. N.: Am. J. Anat. **22**: 225 (Sept.) 1917.
3. Long, J. A., and Evans, H. M.: Memoirs of University of California **6**, 1922.
4. Evans, H. M., and Bishop, K. S.: J. Metab. Research. **1**: 1-22 (March) 1922.

that reducing the amount of protein delays the appearance of the first estrus and lengthens the resting interval between successive periods. He has also observed that curtailing the number of calories will delay the appearance of the first estrus and prolong the interval if the reduction is slight. If the amount of food is still further reduced the effect is even more extreme, and there comes a point at which activity of the reproductive tract ceases altogether or never

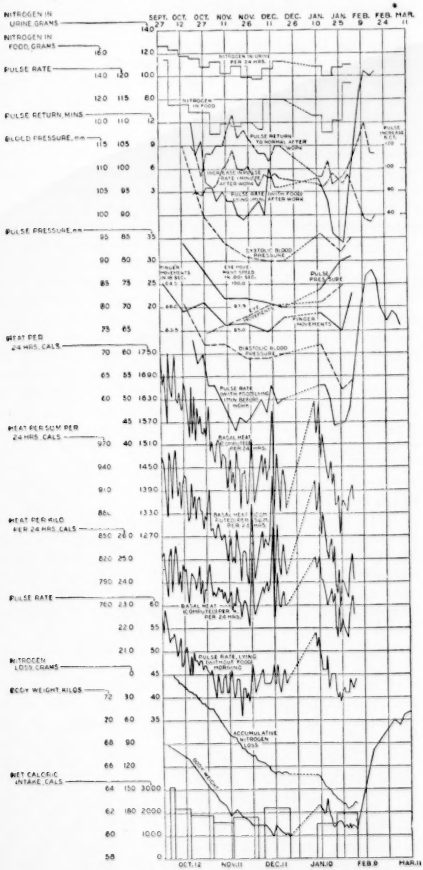

Chart 1.—Clinical observations in twelve normal men on a restricted diet. Reprinted from publication 280, Carnegie Institution of Washington, through the courtesy of Dr. F. G. Benedict.

develops, though the animal may continue to function otherwise in a fairly normal manner except that it grows not at all or at a much retarded rate. Actual figures in a similar series that I [5] carried on showed that when adult rats were on a diet consisting of protein 2.4 Gm., fat 2.4 Gm., and carbohydrate 6.72 Gm., a total of 59 calories, reproduction was normal.

5. Macomber, Donald: Unpublished material.

When the diet was reduced 33 per cent to protein 1.6 Gm., fat 1.6 Gm., and carbohydrate 4.48 Gm., a total of 39.7 calories, reproduction ceased altogether until the diet was restored to normal, though the weight and health of the animals was little affected.

Many other investigators, particularly Osborne and Mendel, McCollum, Simmonds, and Sherman,[6] have made notable contributions to this subject, but space precludes more than a mere mention of their names.

An important piece of work was undertaken by Dr. Francis G. Benedict and his associates [7] in the nutrition laboratory of the Carnegie Institution in Boston in 1917 on human vitality and efficiency under prolonged restricted diet. The work was done during the war at a time when many food restrictions were in force. The object was to investigate such food restrictions and to learn what effect they might have on the general metabolism of the body. For this purpose, two squads of twelve men each were chosen from the students of the Springfield Training School. Squad B served as control but later was also used for a short period of dietary restriction. Squad A, starting with an average body weight of 68 Kg. and a diet containing between 3,000 and 4,000 calories and about 100 Gm. of protein, was submitted to such dietary restrictions that the men lost about 12 per cent of their weight. To do this it was necessary to restrict the calories to between 1,600 and 1,800. When the weight had fallen to the desired level, the calories were raised slightly to about 2,100 or 2,200 to maintain them at this point. The dietary restrictions lasted about four months, with the exception of the Christmas recess. No attempt was made to alter the character of food eaten. The portions were merely limited so that the total calories eaten were as indicated. It has been said that before the experiment these men were taking about 100 Gm. of protein. As the experiment progressed this amount dropped to close to 60 Gm. These men were apparently normal throughout the experiment and were able to carry on their regular work and exercise. They were under most careful supervision, and prolonged observations were made on blood pressure, gaseous metabolism, nitrogenous metabolism and pulse rate.

Extraordinarily profound results were noted (chart 1). For instance, the blood pressure dropped from 115 to 90 systolic, and from 80 to 63 diastolic. The morning pulse rate dropped from 60 to between 40 and 45. The basal metabolism fell between 18 and 20 per cent. During the entire experiment there was an accumulated loss of nitrogen of approximately 175 Gm., which would correspond to about 1,100 Gm. of protein. It was also noted that the reaction time for carrying out certain coordinated movements was definitely prolonged. Nearly all the subjects showed a slight but definite anemia, and toward the end began to develop mental irritability.

From the point of view of reproduction, this experimental demonstration of the effect of restricted diet on human beings leaves much unanswered. Profound though the effect was on metabolism, circulation and protein metabolism, and though it may be surmised that there undoubtedly was an equally profound effect on fecundity and reproduction in general, there is no actual experimental evidence for this assumption. Certain

6. Osborne, T. B., and Mendel, L. B.: J. Biol. Chem. **35**: 19 (July) 1918; **41**, 1920; **23**, 1915. McCollum, E. V.: The Newer Knowledge of Nutrition, New York, MacMillan Company, 1925. Simmonds, Nina: Am. J. Hyg. (supp.) **4**: 1 (Sept.) 1924. Sherman, H. C.: Chemistry of Food and Nutrition, New York, MacMillan Company, 1926.

7. Benedict, F. G., and others: Pub. 280, Carnegie Inst. Washington, 1919.

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observations were made, however, in regard to the sex life of these men and these are of such a striking nature that they confirm the suspicions that restricted diet does lower reproductive activity in men just as it is known to do in animals. The men observed were all single with the exception of one. They were college students living and working under the usual conditions

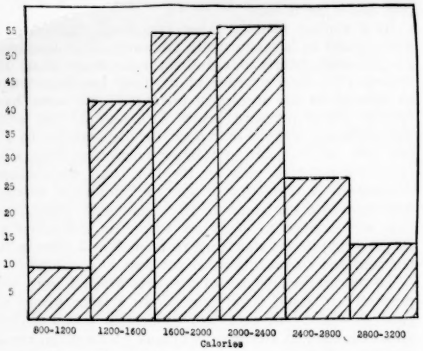

Chart 2.—Frequency polygons showing total calories in the diets of 206 sterile women.

of college life and taking a normal amount of exercise. The men noted without exception that while on the diet the occurrence of nocturnal emissions ceased altogether, as did all erections or other sex phenomena.

A similar human experiment was carried out in Germany during the war on medical students. This is cited by Graham Lusk.[8] In the same review he quotes Gaspard,[9] who reported that during the serious famine in France in 1817 many women noted cessation of the menses and that the number of conceptions during the period was less than half those occurring in corresponding months of the years before and after. Rubner[10] is also quoted in regard to his report on undernutrition in Germany during the blockade. At that time the ration as actually distributed contained only 31 Gm. of protein and 1,344 calories. There was a loss of 20 per cent in body weight and a great increase in the number of deaths. This diet also caused a cessation of menses in many women and therefore increased the percentage of sterility.

Taken altogether, the evidence thus presented from animal and from human experimentation seems quite conclusive that restrictions in the diet of one kind or another may have most profound effects on reproductive activity in general. For the evidence to be complete it should be possible to find and demonstrate the presence of clinical cases showing the effect of such restrictions.

In the nature of the case this is an extremely hard thing to do, since so many factors enter into any human equation. If, however, it can be shown that analysis of the diets eaten by sterile patients shows deficiencies, and if it can be demonstrated that functional changes occur in these patients similar to those proved to be caused by dietary restrictions, one has good presumptive evidence. Proof of the theory would be strengthened still further if cases could be brought forward in which dietary changes alone were responsible for a return to normal fertility. It must be remembered, however, that human beings are not guinea-pigs and cannot be treated as such, and therefore evidence of this sort will never be absolutely conclusive. For what they are worth I shall include some actual case histories. Before presenting them I wish to give an analysis of the actual diets.

DIETS USED

For two years I have had each patient submit lists of all food taken for three or four days. These lists the patient kept as a daily record, using ordinary household measures to determine the amounts. The lists were then sent in to me, and with the aid of Locke's Food Values[11] the approximate number of grams of protein, fat and carbohydrate and the total calories were calculated for each day. This method gives a much more accurate idea of the character of the diet than I have been able to obtain by other means.

In calculating my results I have taken the diets without selection from 206 women who have consulted me for sterility. In the nature of the case many of these women were normal, the trouble being with their husbands. In many others the difficulty was a purely mechanical one, such as closed tubes. On the other hand, the trouble in most of the cases was of a functional nature and one which might have been produced or influenced by changes in diet. It is obvious that nothing can be proved from the analysis of the diets from such an unselected group. On the other hand, if the averages of such a group do deviate from normal to any marked degree, that fact will be all the more suggestive because the cases are unselected.

The result of these analyses have been gathered together and are shown in charts 2 and 3. The average diet for the 206 women was found to be 71.8 Gm. of protein, 80.5 Gm. of fat and 227 Gm. of carbohydrate, with a total of 1,968.9 calories. To determine whether this deviates from normal and the amount of this

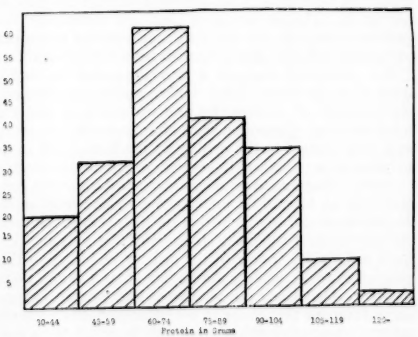

Chart 3.—Frequency polygons showing amount of protein in the diets of 205 sterile women.

deviation, it must be compared with some standard. Standards vary, but that proposed by Langworthy[12] after a study of actual dietaries the world over is perhaps as fair as any. He proposes for a man at moderate activity 100 Gm. of protein and 3,000 calories. On this

8. Lusk, Graham: The Physiological Effect of Undernutrition, Physiol. Rev. **1**: 523 (Oct.) 1921.
9. Gaspard, B.: J. de physiol. exp. et path. gén. **1**: 237, 1821.
10. Rubner, M.: München. med. Wchnschr., 1918, number 8, supp.
11. Locke, E. A.: Food Values, New York, D. Appleton & Co., 1915.
12. Langworthy: Food and Diet in the United States, Yearbook of U. S. Dept. of Agriculture for 1927.

basis a woman should take 80 Gm. of protein and 2,400 calories. Allowing 80 Gm. of fat to make the comparison more complete, Langworthy's standard would call for protein 80 Gm., fat 80 Gm., carbohydrate 340 Gm., with 2,400 calories. When this is compared with the average diet for sterile patients of protein 72 Gm., fat 80 Gm., carbohydrate 227 Gm., and calories 1,969, the discrepancy is obvious. The calories have been reduced 18 per cent and the protein 10 per cent. Chart 2 shows the frequency of diets with different total calories. It is obvious from inspection

Calories and Protein

Calories	30-44	45-59	60-74	75-89	90-104	105 or More	Totals
800–1,200..	6	4	1	0	1	0	12
1,200–1,600..	10	10	14	5	1	0	40
1,600–2,000..	4	13	23	8	3	1	52
2,000–2,400..	1	5	15	19	13	4	57
2,400–2,800..	0	0	6	8	9	4	27
2,800–3,200..	0	0	2	2	4	4	12
Totals	21	32	61	42	31	13	200

Coefficient of correlation + 0.824 ± 0.015

that if, as stated before, the normal average should be in the 2,000 to 2,400 polygon, this grouping shows a great preponderance of diets containing less than the average.

The accompanying tabulation shows the correlation between the number of grams of protein and the number of calories in 200 of the diets. It is quite evident that there is a definite relationship between these two elements and this is borne out by a calculation of the coefficient of correlation, which gives a figure of + 0.824. This may be stated quite simply by saying that in general the diets which contained more calories contained at the same time more protein as well. This relationship is not peculiar to sterility but has been noted by every one who has made a study of human dietaries. The chief importance comes in the dietary treatment of obesity when the total calories have to be restricted. Unless stress is laid on increasing the protein, a patient's natural taste may lead her to restrict protein to a degree that is not consistent with health.

For statistical analysis it was impossible to figure more than the items which I have mentioned; namely, the amounts of protein, fat and carbohydrate and the total calories. Questions were of course asked in every case with regard to the quality of the food eaten so as to determine whether it seemed adequate in vitamin content. There were no diets in which the vitamin content was so low as to amount to an actual deficiency. It can, however, be stated that on the average the diets did not contain sufficient amounts of the various vitamins to be safe. Some of the diets were so low in this respect as to be actually dangerous from a health point of view. Deficiencies in vitamin A and vitamin D were more frequent than those in the other elements. Of the mineral salts, calcium and iron were most apt to be low, particularly the former. It is of course highly probable that reduction in the amounts of the vitamins and mineral salts may be the most important cause of such changes as Benedict observed when the calories and protein were restricted, but since with our present knowledge it is still impossible to estimate vitamin amounts, this phase of the subject will have to be left as unproved.

The question then arises, Did these women whose diets averaged below normal present any such evidence of disturbed nutrition as that shown by the students in Benedict's experiment? One of the most striking changes was the reduction in the metabolic rate. Unfortunately I have not figures for all the women in my series. In seventy-three, however, basal metabolism determinations were made at least once, and often many times. The figures for this smaller group give a mean for the sterile women practically 10 per cent below the normal (chart 4).

In a similar manner other functional disturbances were found to be abnormally frequent. For instance, 23 per cent, nearly one fourth, were more than 16 pounds (7.3 Kg.) overweight for their height and age as figured in the insurance tables; 11 per cent had systolic blood pressure below 110, and 30 per cent had sufficient anemia to reduce the hemoglobin to 70 per cent or less. In the latter connection and also from the point of view of the low basal metabolism readings, it is interesting to note the number of women who showed disturbances of the catamenia. Menstruation was delayed to every six weeks or less often in 30 per cent; it was shortened to from 1 to 2 days in 10 per cent and was scanty in 35 per cent.

To repeat, the analyses of the diets which I have just presented in some detail came from a large group of patients whose only necessary connection was that they all complained of sterility. In many of them the cause was not a dietary one; in many others, diet contributed to only a slight extent. To round out the picture, it seemed wise, therefore, to present in brief a few case histories from patients in whom diet played apparently a very large part indeed. Even in these cases it will be noted that diet was far from being the only factor involved.

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REPORT OF CASES

CASE 1.—A woman, aged 38, who had been successfully treated by me for sterility some years previous, four years ago, having been through a period of self starvation to keep her weight down, was found to have a basal metabolism of

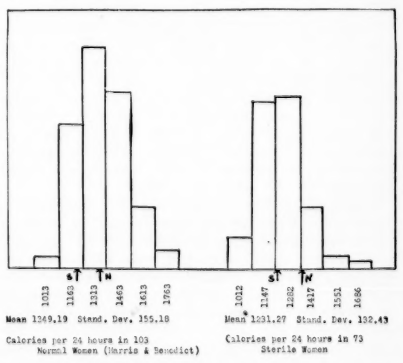

Chart 4.—Comparison of basal metabolism in normal and in sterile women.

— 24 per cent, associated with amenorrhea and general lassitude. She did not make any notable improvement on thyroid medication. Two years ago analysis of her diet disclosed the fact that she was taking only 56 Gm. of protein and 972 calories. Her dentist reported that her teeth were very soft and were decaying rapidly.

On a diet of 100 Gm. of protein, with a total of 2,200 calories, containing eggs, meat, milk, butter, cod liver oil,

green vegetables and fresh fruit, and without thyroid medication, her symptoms disappeared, menstruation returned and her teeth were much improved. This patient has not had other children, as a result, I believe, of a stenosis of the cervical canal, but the amenorrhea has been entirely corrected.

The second case is almost equally striking.

CASE 2.—A woman, aged 35, seen in January, had been married twelve years without children. She was 15 pounds (6.8 Kg.) overweight, complained of scanty delayed menstruation and had a basal metabolism of —23 per cent. Her husband also was overweight and had a metabolism of 22 per cent below normal. He showed by actual count less than half the normal number of spermatozoa. Treatment consisted of a careful reducing diet, small doses of thyroid and plenty of exercise. When they were down to normal weight, the diet was increased for the woman to 90 Gm. of protein and 2,150 calories, and for the man in a similar manner. Both were made to take sufficient exercise to avoid gaining. Conception followed and a baby was born in July, 1928.

The third history illustrates another type of case. The first two patients had low basal metabolic rates, but in this case the metabolism was + 2 per cent.

CASE 3.—A woman, aged 31, first seen in March, 1926, had been married four years without children. She was 46 pounds (20.8 Kg.) overweight and had not menstruated for a year and a half. As a result of losing weight from 168 to 123 pounds (76.2 to 55.8 Kg.) during a year and a half, and of small doses of anterior lobe pituitary extract, the menstrual periods became reestablished and she became pregnant. As so often happens, however, in cases of this kind, the ovum, though susceptible of being fertilized, did not have vitality enough to grow more than a few weeks, and miscarriage resulted. The report of Professor Streeter [13] showed that the fetus had died some weeks previous to her miscarriage in December of this year. Now the problem is to stimulate ovarian activity still further through diet, exercise and endocrine therapy, so that if another pregnancy takes place the ovum will have sufficient vitality to survive till term.[14]

The last case is cited to illustrate the difficulty with which one is confronted in the study of sterility of deciding just what the trouble may be that is chiefly responsible for the failure to conceive, and the equal difficulty of deciding in a successful case which of a number of methods of treatment that may have been tried is the one responsible for the result. The practice of the diagnosis and treatment of sterility, in other words, is still more of an art than it is a science, and it is an easy matter to choose cases or facts from a single case to support some pet theory. In case 4 I believe that the form of treatment that was finally most helpful was diet, and yet it is impossible to come to a clean cut decision.

CASE 4.—A woman, aged 29, first seen in 1922, had been married four years without children. Her weight was then normal. She was operated on for pelvic adhesions involving the tubes and ovaries, and for cystic ovaries. After operation she gained weight and menstruation became scanty. In 1924 her metabolism was — 13 per cent. Small doses of thyroid did not help materially. In September, 1927, she was given three stimulating roentgen treatments over the ovaries. Reexamination after this showed a diet containing only 60 Gm. of protein and a secondary anemia. A diet with high protein and one calculated to correct the anemia, together with a regimen of hard exercise, caused a marked improvement in her physical condition. Conception occurred in April, 1928, and a normal baby was later born at term. There is, of course, a definite possibility that the roentgen treatment was an important element in this case, but my strong impression from following it closely was that diet and exercise played the major rôle.

13. Streeter, G. L.: Publications of the Department of Embryology, Carnegie Inst. Washington.

14. Macomber, Donald: Boston M. & S. J. **193**: 116 (July 16) 1925. Huntington, J. L.: New York State J. Med. **22**: 559 (Dec.) 1922; Am. J. Obst. & Gynec. **17**: 32 (Jan.) 1929.

COMMENT

An important consideration here is the evidence these patients present of disturbance in the function of the endocrine glands. It has long been known that such disturbances have a definite association with fertility. In fact, it has generally been thought that these disturbances may be looked on as the actual cause of the sterility. No one, however, as far as I am aware, has ever explained what causes these glands to function in an abnormal manner. It seems to me that the work already reported in some detail of Benedict and his associates [7] may give the clue to this enigma. He showed conclusively that changes in diet sufficient to affect the nutrition (chart 1) will produce profound disturbances of metabolism. If the young men of his experiment had come for treatment complaining of various symptoms, and the low metabolism, low blood pressure, slow pulse and anemia had been found, they would most probably have been diagnosed as having endocrine disturbances. If, therefore, patients come with similar conditions and on careful history we find that their diets have been inadequate, should we not think of the dietary cause as perhaps preceding the endocrine disturbance? That does not mean that when we come to the question of treatment we should not use endocrine measures as well as dietary ones. To get the best results, a combination of the two is often most effective.

CONCLUSION

Finally, I think it may be said without exaggeration that there is a large body of evidence, both experimental and clinical, which shows that alterations in diet actually do produce sterility. An analysis of the diets eaten by 206 sterile women shows that they deviate in many important ways from normal. A large number of these women show evidence of nutritional disturbances. Of the 206, forty have become pregnant to date, even though practically all of them were seen for the first time within the last two years, and this result has occurred, at least in part, as the result of changes in diet and such other measures as the increasing of exercise, the taking of endocrine medication or the treatment of anemia. It seems to me, therefore, that we have in diet a means of treating sterility which we cannot afford to neglect.

321 Dartmouth Street.

ABSTRACT OF DISCUSSION

DR. HARRY STEENBOCK, Madison, Wis.: Those of us who were seriously and intensively interested in the field of nutrition some years ago were satisfied if we could pick a diet apart and put it together again and observe the effects on the growth of the young animal. But within the last ten years we have come to realize more and more that even though we could make composite diets satisfactory for normal growth, satisfactory reproduction need not necessarily follow. In other words, it was emphasized to us very definitely that the function of reproduction has very specific requirements for its normal consummation. Then, again, we have also been led to conclude that the function of lactation is very specific, and also has very specific requirements. In the ordinary course of reproduction there is, of course, in the female, ovulation, migration of the ovum, fertilization, implantation in the uterus, growth in the uterus and parturition. We do not know how many of these individual steps have their specific nutritive requirements, but we do know that a deficiency of protein or of calories will delay the onset of estrus in the young animal and will prolong the interestrual periods. We know very definitely that a lack of vitamin A and of vitamin B in the diet will bring to a complete cessation the activity of the ovarian follicular mechanism. In the case of vitamin B deficiency, after a period of sexual inactivity persist-

ing over many months, if that deficiency is corrected, normal function will apparently always be reinstated. That is also apparently true in the case of deficiency of vitamin E. No doubt many of you are familiar with the work of Dr. Evans of the University of California who, as the discoverer of vitamin E, brought out most interesting relations with respect to the growth of the embryo in the uterus. He found that when vitamin E is lacking in the diet there will be normal ovulation, normal migration, normal fertilization and normal implantation in the uterus, but after the embryo has grown, say for a period of fourteen days or more, in the case of the rat, resorption of the embryo always follows. That brings out a very specific instance of how the embryo in this particular case has specific nutritive requirements. So, when Dr. Macomber presents these general relations, I am sure that the fact is appreciated that there is great necessity of very detailed analysis of the relation of diet to fertility.

DR. J. C. LITZENBERG, Minneapolis: Dr. Steenbock said that the question of sterility is a very intricate one and due to many varying causes. In my own work on sterility and the relation of basal metabolism to gestation, I drew the conclusion that the low basal metabolism was probably the index of one of the causes of sterility. Dr. Macomber has brought out in his paper that patients deficient in certain elements of their diet had low basal metabolism, and at the same time were sterile. We also found in our investigations of the low basal metabolism that a reduction of the vitality of the individual by overwork caused sterility, but if they were simply made to rest and put on a proper diet, fertility would return. Dr. J. A. Urner, who has been working in our department at the University of Minnesota, has been investigating the subject of the deficiency of vitamin E. He found that all rats deficient in vitamin E conceived with very great difficulty and in every one of those animals there was resorption of the fetus. The causes of sterility are so varied and the ovaries and the testes so susceptible to varying influences that this is distinctly a physiologic problem, certainly not alone gynecologic. We are now interested in physiology, physiologic chemistry, diet, basal metabolism and so forth. We know from our knowledge of embryology and anatomy that the ova and the spermatozoa are resident in the body for the reproduction of the race, and that their delicacy makes them more easily affected by disturbances of physiologic processes than any other cells in the body.

Clinical Notes, Suggestions and New Instruments

THE PROPER USE OF PHENOBARBITAL IN THE TREATMENT OF THE EPILEPSIES

ROY R. GRINKER, M.D., CHICAGO

The conception that the epilepsies constitute a convulsive syndrome due entirely to pathologic changes within the brain is waning. Pathologists have ceased to consider the morphologic changes found in the nervous tissue of the so-called idiopathic epilepsy as causal but rather as a result or corollary of the convulsions. In organic brain diseases, almost identical lesions may in one instance be associated with convulsions and not in another. The idea of Lennox and Cobb that a functional element consisting of various physicochemical factors and an unknown "convulsive capacity" plays a variable but always a large rôle in the production of the convulsion along with the structural brain changes is an acceptable hypothesis.

Thus the solution of the epilepsies may be made by purely biochemical means and their probable rational treatment directed on such a basis. Yet until such therapy is discovered the economic and sociological problem of the large number of epileptic patients who are unable to work because of occasional convulsions is a pressing one. The physician must knowingly then treat a symptom, that of convulsions, and for this purpose his best therapeutic agent is phenobarbital. Although ten years has elapsed since its introduction into this country, the technic of the successful administration of phenobarbital is but little known. The purpose of this article is to outline such use of the drug.

It was originally advised to prescribe phenobarbital to epileptic patients in evening doses of 1½ grains (0.1 Gm.) and it is still prescribed most frequently in this manner by physicians. However, definite dosages cannot arbitrarily be stated for any one patient since the "convulsive threshold" must vary enormously. The time of administration of the drug should vary and correspond with the time at which the convulsions usually appear. With the major convulsions there is frequently a certain rhythm in the occurrence of fits, varying from certain daily periods to a weekly or seasonal incidence. Or the time interval may be irregular but the spells always nocturnal or diurnal. Other patients may have convulsions at any time of the day or night at extremely irregular intervals. Each patient is therefore an individual therapeutic problem and must be treated by the method of trial and error over a period of time in order that the proper dosage should be given at the proper time.

If the patient has only nocturnal seizures, the only dose necessary may be administered after the evening meal and except in the very young this should be started with 1½ grains. Similarly, when convulsions have regularly occurred only in the forenoon, the phenobarbital should be given after breakfast or, if necessary, also in the evening. When the spells have occurred only in the afternoon, the drug should be first given only at noon. This dosage may be successful in an individual having occasional spells at these definite times. When the spells occur more frequently and severely, the use of one dose of 1½ grains may not be enough. The phenobarbital should be first increased to 2 or 2½ grains (0.13 or 0.16 Gm.) at the single administration. Then if the "convulsive threshhold" is still low and spells break through, the drug should be given twice daily and, if necessary, after each meal, beginning with three-fourths grain (0.05 Gm.). With necessity the dosage should be gradually increased by one-fourth grain (0.016 Gm.) jumps to 2, 2½ or even 3 grains (0.13, 0.16 or 0.2 Gm.) three times daily.

When convulsions occur irregularly at any time, phenobarbital should be started in three-fourths grain (0.05 Gm.) doses three times daily and increased with necessity to as high as 3 grains (0.2 Gm.) three times daily. For frequent appearing convulsions, for example several times weekly, the initial dosage should be 1½ grains (0.1 Gm.) three times daily. This applies to children as well as to adults.

The drug should be prescribed in powder form put up in capsules unless the dosage is exactly the amount of the commercially prepared tablets. Breaking the tablets into halves and fourths is rarely satisfactorily done by the patient. When other drugs are used simultaneously, such as cascara, they may be included in the capsules.

Certain obstinate cases may not respond well to the powdered phenobarbital alone. Then extract of belladonna in one-tenth to one-fifth grain (0.006 to 0.012 Gm.) amounts or more may be experimentally included in the capsules. At times it may be necessary to try the soluble phenobarbital sodium when high doses of the powder have not had the desired effect. Perhaps the quicker absorption of the soluble form explains its occasional better results. Best of all in the intractable case is the combination of phenobarbital sodium and sodium bromide in solution. For the most resistant convulsions, from 15 to 20 grains (1 to 1.3 Gm.) of bromide and 1½ to 2½ grains (0.1 to 0.16 Gm.) of phenobarbital three times a day may be necessary. The sodium phenobarbital deteriorates in solution so that only a quantity lasting three weeks should be prescribed at a time.

It may seem to the physician that very large doses have been advised. This is exactly the point I wish to stress: that the usual use of phenobarbital is not carried out to fit the patient. The dosage must be increased and the time of administration varied to fit the individual case. One is rarely limited in increasing the dose by the toxicity of the drug, which is extremely low although infrequently an idiosyncrasy against phenobarbital is encountered causing a skin rash and a systemic reaction. One is limited, however, by the sleep-producing effect of the phenobarbital. All patients at the beginning of the treatment become somewhat drowsy; but in a few weeks' time if activity is continued this wears off and only the desired anticonvulsive effect remains. When drowsiness persists and the dosage must still be increased, resort to the bromide phenobarbital mixture may be taken. In the exceptional case of

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grand mal type, the dosage cannot be increased because of sleepiness and the convulsions persist, although reduced in number. Occasionally a slight tolerance is established in that a patient who has been free from spells for months or years suddenly has a convulsion. Slightly increasing the dosage usually suffices here.

It has been my experience that, when a patient is suffering from an organic epilepsy due to cerebral vascular disease or trauma, the convulsions require a much larger amount of phenobarbital before they are controlled. Furthermore, a supposed idiopathic epileptic patient whose spells cannot be controlled by dosage as high as 2 grains (0.13 Gm.) three times daily should be carefully reexamined to determine whether such possibilities as cerebral tumor or other organic etiology has been overlooked.

Once the proper dosage of phenobarbital is obtained by varying the amount and time of administration, it should be continued indefinitely. The drug is not habit forming nor does it produce mental symptoms. Rather, when successful, it avoids the terrific brain injury which probably results from each spell and which is probably the cause of the epileptic dementia. Patients secured free from spells by the use of phenobarbital usually do not deteriorate mentally.

The phenobarbital should not be withdrawn abruptly. Patients who have not had spells for months or years decide, frequently, that their medication is unnecessary. Stopping its use for a day or so invariably results in convulsions which are far worse than ever before and which may even go on to a status epilepticus. One can usually correctly accuse the patient of not taking his medicine when a severe attack suddenly appears after a year or more of freedom. Hospitalization of these patients for any cause, and operations, should not be an excuse for withdrawing the phenobarbital. If withdrawal is necessary, gradual diminution of the dosage should be carried out. Patients should be taught never to be without an ample supply of medicine.

Our conception of epilepsy is such that a cure can hardly be thought of. But is it possible to stop the phenobarbital after spells have not been observed for several years? This can frequently be done or at least a much smaller dosage eventually given. In children, especially, when puberty and young adult life has been passed, phenobarbital may be gradually withdrawn. One may postulate the development of a "spell habit" in the epileptic patient with the necessary precipitating cause of the convulsion becoming less and less intense. Stopping the spells for a number of years may necessitate the precipitating cause again to be more intense, and this is probably less liable of occurrence in adult life with fewer metabolic stresses.

A meat-free diet does not have any advantage, but a modified ketogenic diet may accompany the phenobarbital therapy. Unfortunately the ketogenic diet alone is rarely successful in adults. General physical abnormalities should be corrected, especially the usual associated chronic constipation. Avoidance of stimulants, such as coffee, tea and alcohol, must be observed. Exercise need not be forbidden. Pregnancy usually does not have any effect on the phenobarbital therapy. Dangerous occupations must be forbidden even when spells are controlled as a convulsion may break through at any time.

Status epilepticus has been usually considered as a fatal complication of epilepsy, but with the use of phenobarbital many patients can be saved. Sterile phenobarbital sodium in from 3 to 5 grain (0.2 to 0.3 Gm.) doses should be injected intraspinally in from 5 to 10 cc. of physiologic solution of sodium chloride after drainage of the spinal fluid. This may be repeated if necessary in two hours. Intravenous injections of the phenobarbital sodium in 3 grains (0.2 Gm.) every four hours as long as necessary may also be carried out. These procedures may be repeated more frequently if the convulsions persist, as heroic measures are necessary in this often fatal condition. The concomitant use of chloroform inhalations and repeated spinal drainage may be of help.

Petit mal attacks of any type, whether present as the only epileptic phenomenon or associated with the generalized convulsion, are difficult to treat with phenobarbital. They may be reduced in number but rarely are they stopped altogether. It is not advisable to employ large doses of phenobarbital for this form of epilepsy as it is without avail.

55 East Washington Street.

Special Article

DISTRIBUTION OF VITAMIN D

COD LIVER OIL *

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So far the assumption has been tacitly made that cod liver oil is *par excellence* the natural source of the antirachitic vitamin. While this is true only with certain reservations, the importance of the oil can hardly be overstated, both for practical use and for laboratory research. It had been used for many years in the treatment of rickets with a fluctuating amount of medical respectability before the discovery was made that rickets actually is a deficiency disease due to the lack of a substance occurring in the oil. Then came the knowledge of the distinction between this substance of antirachitic potency and the already known vitamin A, and following and parallel with this discovery a vast amount of information, still incomplete, of the functions of this vitamin D in the body.

GROWTH IN USE OF THE OIL

Not often does nutrition research have so marked an effect on a business as it has had on the cod liver oil industry. In the six years from 1922 to 1927 the imports of cod liver oil and cod oil together have more than doubled as shown by the figures from the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce given in the accompanying table.

Cod Oil and Cod Liver Oil Statistics of Imports Into the United States

Year	Gallons	Year	Gallons
1922	1,809,478	1925	2,975,510
1923	2,316,562	1926	4,347,024
1924	2,846,588	1927	4,495,375

"Cod oil" is the name given to oil from rotted livers, which is now seldom used in medicine but is used in the technical arts, especially tanning. If the figures were given for cod liver oil alone instead of combined with the cod oil, they would be far more startling, for fishermen now tend to boil down the livers promptly for medicinal oil instead of sending them to importers for the production of cod oil. The *Commerce Yearbook* for 1928 says, "Medicinal oil production has increased greatly, and the advance in its price has lessened the supply of common cod oil for tanning."

The United States imports almost all its cod liver oil from Norway (the leading source), Newfoundland and the United Kingdom, and even a little from Japan.

CHEMICAL COMPOSITION

The chief components of cod liver oil are the same as those of other fats and oils and especially other fish oils—olein, myristin, palmitin and stearin, and the highly unsaturated and less well known clupanodonin and docosapentenoin, to which the fishy smell is partly due, and others. Bills, chemist with Mead Johnson and Company, lists a number of the acids "the existence of

* This article is a chapter from the book "Ultraviolet Light and Vitamin D in Nutrition," to be published shortly by the University of Chicago Press.

which is reasonably well established" and others "less well established," showing that the composition has not been thoroughly investigated, probably because in the past chemists were not much interested in the oil and now their interest is in its vitamin content.

In consideration of this available information on the make-up of oil and its similarity to other oils, it is not surprising that the common sense view of its value used to be merely that it was especially easily assimilated. Theories of fatty acids with special chemotherapeutic properties have not been substantiated.

The part that is being investigated today is the nonfatty or unsaponifiable portion, which makes only about 1 per cent of the whole, but which contains both vitamins A and D. According to Bills, this unsaponifiable fraction is about half the solid alcohol cholesterol, and half pigment, vitamins, hydrocarbons, complex alcohols, and unidentified matter.

MEASUREMENT OF ANTIRACHITIC POTENCY

Since it is the vitamin potency of cod liver oil that we are particularly interested in, we much need a quantitative method for determining the vitamin content. Some day probably we shall be able to say that a given sample of the oil contains such a percentage of A and of D. Before that we can be fairly well satisfied by the selection of an arbitrary unit of vitamin potency, such as has already been done for vitamin A, and statements of the number of units contained in different oils.

The unit which we should like for D would be something of this order: the amount of vitamin D which when fed to rachitic rats will cure them in so many days. The variables involved in this seemingly simple statement are very numerous. Among the questions to be decided are these: Which of the rachitogenic diets shall be adopted as standard? What shall be the criterion for rickets and healing of rickets—blood composition or bone composition or mineral retention, or the line test or what? Shall rickets be produced in the rats and then cured, or shall its prevention be the measure of potency?

An elaborate comparison of a number of methods recently made in McCollum's laboratory at Johns Hopkins leads to the conclusion that there are still many uncertainties and irregularities in these points. Adoption of a unit therefore seemed premature, and a check on research rather than a help.

This emphatically does *not* mean that we must go without knowing whether a given oil is high or low in D. It means that an investigator or group of investigators will have their own methods and will report the "relative potency" of their samples. Sometimes, however, close comparison of one worker's results with another's cannot be satisfactorily made.

Bills's Method.—The method developed by Bills in the Research Laboratory of Mead Johnson and Company is particularly clear-cut. He gives very definite directions for feeding the diet (McCollum's 3143) for eighteen (or a few more) days after weaning and then feeding the test preparation for exactly five days, taking care to use only rats that eat satisfactorily and do not lose weight. The line test is his criterion of healing. He distinguishes four degrees of healing by one to four plus signs. The "minimum curative dose" is the amount of the oil required to produce definite but not extensive healing.

As a standard he takes the average activity of Newfoundland medicinal cod liver oil. On the average this produces distinct (2 +) healing at a level of 0.25 per cent of the diet. He calls this standard 100 and compares other oils on this scale. Some of his results are given here.

Coward's Suggestion.—Coward in England has just made an interesting suggestion which is too new as yet to have received general acceptance. It is that the unit of antirachitic potency shall be defined as the amount of activity contained in 0.0001 mg. of irradiated ergosterol. A specially prepared irradiated ergosterol has been adopted as a standard for assay of the vitamin.

The New Official Unit.—Just as this book is going to press (Aug. 31, 1929) comes the announcement of the acceptance of a unit by the Council on Pharmacy and Chemistry of the American Medical Association. One "rat unit of vitamin D" is "that amount of vitamin D which, when uniformly distributed into the standard vitamin D deficient diet—ration 2965, *Journal of Biological Chemistry* **64**:263 (June) 1925—will produce a narrow and continuous line of calcium deposits on the metaphyses of the distal end of the radii and ulnae of standard rachitic rats." That is, the line test and Steenbock's rachitogenic diet are henceforth the standard. A "potent cod liver oil" contains one of these rat units in every 0.75 mg. This step of adopting a unit has been taken particularly for measuring the potency of samples of irradiated ergosterol, now to be officially known as "viosterol."

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DIFFERENCES IN COD LIVER OIL

Tests on Commercial Oils.—Outside the laboratory we have no way of being sure whether or not a given commercial oil is highly potent. Relying upon the good reputation of the drug house, however, seems to be safe. Adams and McCollum, after testing eighteen samples and finding considerable difference in potency, concluded that the size of the usual dose for children and the length of time the oil is taken supply "a sufficient factor of safety." It is "probable that any of the better grades of oil upon the market afford protection."

However, the eighteen samples (designated by number only, not by trade names) fell into three groups as to potency—relatively high, moderate, and relatively low. Those "relatively high" gave a 3 + or 4 + line test when making up 0.125 per cent of the diet; one of those "relatively low" gave only a plus line test for twice this amount (0.25 per cent). The "factor of safety" may be adequate and yet one has a desire to know whether and how these markedly different oils are on the market; also whether the oil of a given firm is fairly constant in potency.

More specific information concerning four different high grade cod liver oils marketed in England has been reported by Coward, who measured their antirachitic potency in terms of her unit of the activity of 0.0001 mg. of a standard preparation of irradiated ergosterol. The best oil contained 150 units per gram, and the poorest 50 units, while the other two samples gave intermediate values of from 70 to 80, and 100 units, respectively. Probably even the poorest of these oils would be adequate to protect a baby from rickets, but again one would like to be certain of the potency of any particular oil used.

Antirachitic Potency in Relation to the Volume of Oil in the Liver.—Hess, and Bills and Honeywell have recently combined forces for an investigation that may well have great influence in the commercial production of cod liver oil as well as on scientific knowledge. Ordinarily, they remind the reader, cod liver oil is obtained at the height of the fishing season in the spring or summer, when the livers are large and fat and yield the greatest amount of oil. In Newfoundland the liver

then weighs about one-fourteenth as much as the entire fish and contains about 50 per cent of oil. At other seasons when the livers are lean and small or "poor," it has been taken for granted that they are unsuitable for the extraction of a high-grade oil.

The investigators had at their disposal a large number of cod at the hatchery of the Bureau of Fisheries, Woods Hole, Mass. During the winter months the cod there are kept in a large tank and fed very little, so that the fish used were practically in a starved condition. As a result the livers were very small and their oil content was very low, so low that to obtain samples the oil had to be extracted with cold ether.

Yet these oils were extraordinarily potent. By Bills's method, using a scale with high-grade medicinal oil as 100, the poorest of them assayed at 150, most of them above 1,000, and the best at 20,000—two hundred times as strong as the usual good material. This oil was very dark. In general, the less oil in the liver, the greater the potency. "For a fish of a given size, antirachitic potency varies inversely with the amount of fat or oil in the liver."

It seems surprising that the antirachitic factor should remain in the liver while the fat itself is consumed. Apparently the fat is oxidized away in the daily metabolism of the fish when the diet is low, but the antirachitic substance resists oxidation, remains behind, and becomes concentrated in the greatly impoverished liver. When the liver fattens again, its content of the vitamin increases but the oil never approaches the high potencies reported in this study.

Does the Cod Synthesize Vitamin D?—A certain answer to this question has not been secured but probably the answer is "yes." Two years before the study just reported, Bills published data showing almost surely that the cod cannot get nearly the full amount of D in its liver from its main food, a little fish called "caplin" which has very little of the vitamin. Also further to investigate the problem he kept other fish, fresh-water catfish, in darkened aquariums and fed them on trimmed raw veal muscle, the ether extract of which had showed no antirachitic activity by rat test. After nine weeks on this diet, ten of the fish were killed and their oil was found to assay essentially the same as that of the controls at the beginning of the experiment. The continued potency, Bills argues, could be the result of either synthesis or storage. But later on after the fish had grown more and fat deposits increased, the oil was still of normal or slightly increased potency, though they could not have obtained the increase from this food.

Nor, apparently, do fish elaborate the vitamin through the influence of ultraviolet rays. These catfish were kept in the dark. Others irradiated with a 220-volt uviarc for five minutes every other day for six weeks under 20 cm. of water were adversely affected, so that three died and others became subnormally active, and their oil showed no increase in potency.

Bills therefore suggests "that the substance, or group of substances, known as vitamin D may be synthesized by fish."

Vitamins A and D in Cod Liver Oils not Parallel.—We tend to think that the two known vitamins of cod liver oil must be in the same proportion in different samples, but we have no justification in such expectation. In fact, English investigators who have recently taken the trouble to study the point have found that some which are relatively rich in A are poor in D, and others rich in D are poor in A.

OTHER FISH OILS

Cod liver oil, as already suggested, is not the only active fish oil. The most active substance so far investigated, aside from the extraordinarily potent liver oils of the starving cod, is that from the puffer fish liver. First observed by Hess and Weinstock in 1926, it assays fifteen times as powerful as medicinal cod liver oil—fifteen hundred on Bills's scale. Bills has also tested a number of others. For example, the oil from a sample of goosefish liver from Boston is the same as cod liver oil, 100; shark liver, Newfoundland, is 75; haddock liver (five samples) is 10.

Not only the liver but the body oils of certain fishes are active. Four samples of herring from Newfoundland and four samples of sardines from California gave oils with a potency of 100. As the fat content of herring averages 7.1 per cent of the edible portion and one might readily eat the flesh of from one-half to one pound of the fish, the 9 to 18 Gm. of oil furnished will give a good dose of vitamin D. Sardines have about the same percentage of fat, and so they also can compete with cod liver oil. Salmon body fat, too, is potent—one-fifth as potent as cod liver oil. A sample of the blubber oil of an adult female seal is only slightly antirachitic (3 on Bills's scale) and that of the newborn seal not at all.

Burbot, "the nearest fresh-water relative of the cod," is found extensively in all our large inland waters, such as the Great Lakes and the streams leading into them, but it is seldom used for human food. It is rather considered a nuisance and a waste product by fishermen. Though the fish weighs only about 3 pounds, the liver is very large, sometimes weighing up to half a pound, with a percentage of oil varying from 36 to 56. Clow and Marlatt, of the home economics department of the University of Wisconsin, have just reported a comparison of the antirachitic potency of this oil with Mead Johnson cod liver oil. They found the burbot liver oil eight times as active as the other. Remembering the possible variability proved for cod liver oil, they conclude conservatively: "At least, we probably can assume that burbot liver oil may be classed with cod liver oil as an excellent source of the antirachitic vitamin."

Whether or not these various newly found sources of vitamin D affect the cod liver oil industry remains to be seen.

EGG YOLK

Proof of Potency.—The second most potent source of vitamin D, after these fish oils, is egg yolk. Back in 1923, soon after the clear-cut differentiation of the antirachitic factor, Hess both cured and prevented rickets in rats by giving them egg yolk in addition to their rickets-producing diet. Egg white had no effect. Even more striking was his prophylactic treatment of twelve infants. In an attempt to forestall the development of rickets through the winter months, which his experience had taught him to expect in the great majority of bottle-fed babies, he added the yolk of one raw egg to their regular formulas. In most cases the addition was made in December. In March there was no rickets observable either by roentgen ray or by clinical signs, and the blood phosphates, instead of going through the seasonal ebb noticed the year before, stayed up to the summer value. Incidentally, Hess gives egg yolk to bottle-fed babies as early as five weeks, sometimes giving only half a yolk.

About the same time some of the Johns Hopkins investigators cured seven colored children of rickets, in most cases severe, by adding one or two eggs daily

to their diet of milk and cereal, cure being usually more difficult to accomplish than prevention and therefore even more marked proof of the antirachitic potency of the egg. The results on rats were also confirmed.

Variations in Eggs.—However, egg yolk is not an unvarying food. Both the diet of the hens and the amount of ultraviolet ray which they receive make a great difference in the vitamin D of the egg. For example, in Kansas hens were divided into four pens, receiving, respectively, sunlight in the yard and also thirty minutes' treatment with the quartz mercury vapor lamp, sunlight through glass and the same lamp treatment, sunlight in the yard alone, and sunlight through glass alone. Then their eggs were fed in addition to a basal rickets-producing diet to growing chicks. It will be remembered that chicks are satisfactory animals to use to study vitamin D, since they easily develop a disease similar to rickets.

The eggs produced without ultraviolet ray (sunlight through glass) did not prevent rickets; those with considerable ultraviolet prevented it completely, and those with less (no lamp) allowed the development of slight rickets. These facts have been confirmed by Hart, Steenbock and their co-workers, who increased the antirachitic potency tenfold by irradiation of the hens. Ultraviolet ray falling on the hens, in other words, produces vitamin D in their eggs.

Cod liver oil, too, improves the eggs, for in Ohio hens kept indoors and fed a basal ration fortified by the addition of a small amount of cod liver oil (2 per cent of the ration) produced eggs which were five times as potent as those on the basal food alone, and other hens that had access to a luxurious blue-grass range gave eggs ten times as active as those from hens with the same basal ration but no direct sunlight and no grass.

Accurate comparison between the antirachitic potency of egg yolk, improved or unimproved, and cod liver oil has not been made so far as we know.

Fortunately, the nutrition of the public and the business of the poultryman seem to gain together, for ultraviolet ray not only improves the quality of the eggs but increases the egg production greatly and the hatchability of the eggs. In an experiment at the University of Wisconsin a dozen hens without light treatment produced seventy-three eggs in a month and a similar dozen with ten minutes' irradiation daily, 173. The ordinary eggs showed a hatchability of 28.5 per cent, the others 63 per cent, both improvements of great monetary advantage.

These facts are back of the effort to further the use in henhouses of glasses permeable to the ultraviolet rays, and to install ultraviolet lamps under which the hens can run in groups for a few minutes a day during the winter months when egg production from untreated hens is at a minimum.

The suggestion has been made that poultrymen and consumers alike should recognize that the conception that "an egg is an egg" is a mistaken one, and that "an inadequate ration may yield impoverished eggs as well as animals." Eggs could well be graded on their vitamin content (judged by the ration and management of the layers) as well as on appearance, size and freshness, and such eggs might be demanded especially by hospitals and for infant feeding.

The richness of eggs in vitamin D is merely one of many reasons for their dietary value. Physicians and nutritionists are realizing that the excellent educational campaign for increasing the use of milk could well be supplemented by a similar one for eggs, to the great advantage of babies, children and adults. The dairy industry is making use of its chance for educating the public; the egg industry apparently has not yet realized its possibly even greater opportunity.

COW'S MILK AND BUTTER

Butter fat, although a good source of vitamin A, contains relatively little of the antirachitic factor. In the samples examined by one group of investigators, the butter showed only one two hundred and fiftieth as much antirachitic potency as the particular samples of cod liver oil tested, although the ratio of vitamin A in the two was 1:20 (Jones, Steenbock and Nelson).

Other samples of spring and summer butter assayed by Coward contained only from 0.8 to 1 unit of vitamin D per gram, as compared with 50 to 150 units for cod liver oil. London milk, examined by the same investigator in the late fall (November, 1927) contained practically no vitamin D, but in the following summer it had a value of 0.2 unit per gram. The summer milk therefore contained approximately 50 units per cup, or 200 units per quart, a small, but appreciable, quantity.

The quantity of vitamin D in cow's milk, and consequently in the butter fat, may, however, vary to some extent with the cow's diet. Particularly interesting is recent work in England (Gelding and Zilva) showing that stall-fed cows on a good, practical ration, including silage, gave milk with a fair amount of vitamin D, whether or not cod liver oil was taken in such moderate quantities as 2 ounces daily. More cod liver oil, 6 or 8 ounces, increased the antirachitic potency of the butter decidedly but decreased the percentage of butter fat in the milk. A poor winter ration, without silage or hay, poorer than would ordinarily be fed, resulted in a butter practically free from D.

The influence of sunlight for the cow, or even intense irradiation with artificially produced ultraviolet rays, on the antirachitic potency of the milk is still an unsettled question. According to the University of Wisconsin investigators, irradiation made so slight an increase in the vitamin D of the milk as to have "no practical significance from the standpoint of good milk production." On the other hand, two other groups of investigators report, one that the milk of cows irradiated with a quartz mercury lamp is markedly antirachitic as compared with that of nonirradiated cows (Gowan, et al.), and the other that when a cow on vitamin-free fodder is irradiated the milk has a doubtful clinical benefit when given to rachitic infants, but is strongly antirachitic when fed to rats. In the rat experiments, milk from these irradiated cows proved to be superior even to the milk of cows fed normally (see also Laurens).

Goats, however, react differently in this respect, for the Wisconsin investigators found that irradiation practically doubled the antirachitic value of their milk. The reason for this difference in the behavior of the two animals is not clear. Differences in body area with respect to volume of milk produced may account for it. Other possibilities may be differences in thickness of the hide or secretory function of the skin or translocation of activated compounds.

HUMAN MILK

In view of the fact that rickets until recently probably has occurred in from one third to one half of breast-fed infants in the temperate zone (Laurens), a low antirachitic potency of human milk would be expected in laboratory experiments. However, since the incidence of rickets is lower in breast-fed than in bottle-fed babies, human milk would be expected to compare

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favorably with cow's milk in its antirachitic activity. Rather surprising, therefore, are Outhouse and Macy's recent laboratory observations. With very careful rat technic, making sure that the calcium-phosphorus ratio of the diet was always between 4 or 5 to 1, they compared the antirachitic potency of cow's milk with woman's milk, using for the latter mixed samples from the Wet Nurse Bureau. They confirmed the presence of a moderate amount of D in cow's milk, but found that it is entirely lacking in human milk. Other investigators have found a very slight antirachitic potency in human milk, but less than in cow's milk (Hess and Weinstock).

Observations attempting to connect the diet of the mother and rickets in the babies are somewhat contradictory and difficult of interpretation. However, a recent study of a group of colored babies at Johns Hopkins Hospital does indicate that when cod liver oil is given to a mother a certain amount of the antirachitic vitamin passes into the milk. In this study, forty-seven infants were observed, the mothers of nine of whom had no cod liver oil, while the remaining thirty-eight had been taking three teaspoonfuls of cod liver oil daily from the birth of the baby until it was 6 months old. No cod liver oil was given to any of the babies. Although individual cases showed wide variation in the extent of rickets regardless of the cod liver oil, the average extent of rickets as judged both roentgenographically and by the calcium-phosphorus content of the blood serum varied inversely with the amount of cod liver oil taken by the mothers (Weech).

Irradiation of the mother, too, has been found to give encouraging results. A woman whose milk had been very low in vitamin D was irradiated for a month with a quartz mercury lamp. The antirachitic potency was decidedly increased as shown by the increased serum phosphate and marked calcification of the epiphyses of experimental rats to whom the milk was fed. Interesting and important though these results are, the best way to protect a baby seems to be to give the cod liver oil or the irradiation to the baby direct, rather than to the mother.

SOME FOODS WITHOUT VITAMIN D

Vegetables.—Vegetable foods, even the green vegetables so rich in vitamin A, are ordinarily lacking in D. Hess reports in an early article that spinach, green or yellow lettuce, or green wheat added in large quantity to a rickets-producing diet could not cure or prevent rickets in rats. An extract of dried spinach is even used in animal experiments when a source of vitamin A is desired entirely free from D. Other investigators since then have been able to demonstrate very slight antirachitic properties in cabbage and in fresh spinach, especially that grown in the open during the summer months. Without a doubt, however, the idea prevalent before the distinction had been drawn between A and D that vegetables had marked antirachitic potency has to be abandoned. In view of the facts to be reported on antirachitic activation of foods by exposure to ultraviolet ray, it seems somewhat surprising that vegetables grown in the sunshine should have little or none. The explanation may lie partly in the relatively small amount of ultraviolet ray in the sunshine and partly in its slight penetrating ability, "so that plants, unprovided as they are with any system for the translocation of lipoids, cannot be affected to a high degree."

Yet the old adage to "make hay while the sun shines" seems to have at least slight dietary significance, for, according to Steenbock and Hart, clover hay dried in the sun, without exposure to excessive weathering, had considerable antirachitic potency, while hay dried in the dark, though a fine green color, had none.

Vegetable fats, too, are not antirachitic. Bills has shown the lack in cottonseed, linseed, maize (from white maize), olive, peanut and coconut oils, and in hydrogenated cod liver oil. Occasional samples of coconut oil have been found to have potency, probably, according to Steenbock and Black, because they have been made from a sun-dried copra. Commercial oleo and veal fat extracted with ether were also tested by Bills with negative results.

LIMITED DISTRIBUTION OF D

Vitamin D is thus much the most limited in distribution of all the known vitamins, cod liver oil, other fish oils, egg yolk, and butter fat to a slight extent being practically the only naturally occurring sources so far discovered. It is plain that many children must grow up, and many men and women live from day to day, with very little vitamin D in their food.

University of Chicago.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

ATOQUINOL-CIBA.—Allyl-2-phenyl-quinolin-4-carboxylate. The allyl ester of 2-phenyl-quinolin-4-carboxylic acid. $C_9H_7N.\ C_6H_5COOC_3H_5$ 2:4.

Actions and Uses.—The actions and uses of atoquinol-Ciba are practically like those of cinchophen.

Dosage.—Four to eight tablets in 24 hours, taken after meals, with abundance of water. Twelve tablets may be taken daily for a short time if necessary for the relief of severe pain, but as soon as the active symptoms subside, the dose should be reduced to three to five tablets daily for three days in every week or in alternate weeks. Sodium bicarbonate, 0.6 to 2.0 Gm. (10 to 30 grains) should be administered with atoquinol-Ciba to avoid renal irritation from an excess of uric acid or urates.

Manufactured by the Society of Chemical Industry in Basle, Switzerland (Ciba Company, Inc., New York). U. S. patent 1,336,952 (April 13, 1920; expires 1937). U. S. trademark 142,139.

Tablets Atoquinol 0.25 Gm. (4 grains).

Atoquinol occurs as a yellow, granular, odorless powder, with an aromatic taste; readily soluble in alcohol, about 1 in 12.5; easily soluble in ether, acetone, benzene and fatty oils; insoluble in water. A saturated aqueous solution is neutral to litmus. It melts at not less than 36 C.

Heat about 0.3 Gm. of atoquinol with an equal portion of sodium sulphide crystals: it is decomposed with the evolution of alliaceous odor. Dissolve about 1 Gm. in 25 cc. of alcohol, add 20 cc. of alcoholic potassium hydroxide solution and reflux on a steam-bath for 30 minutes, remove the excess of alcohol by evaporating on the steam-bath, dissolve the residue in 100 cc. of warm water, add diluted acetic acid until no further precipitate is formed, cool; collect the precipitate on a filter-paper, wash with water until it is free from acetic acid; dry at 100 C.: this precipitate responds to U. S. P. X tests for cinchophen. Heat about 0.5 Gm. with 10 cc. of ammonia water: the substance does not dissolve (*distinction from cinchophen*). Dissolve about 0.01 Gm. in 10 cc. of alcohol, add 5 drops of ferric chloride solution: a yellow color results (*distinction from cinchophen*, which produces a reddish brown color). Boil 0.1 Gm. with 0.5 cc. of sodium hydroxide solution and add 3 cc. of iodine solution: no odor develops (*distinction from neocinchophen*, which emits an odor of iodoform).

Boil 0.5 Gm. of atoquinol with 50 cc. of water for two minutes; no odor develops; cool and filter: separate portions of 10 cc. each of the filtrate yield no opalescence with 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution (*chloride*); no turbidity with 1 cc. of diluted nitric acid and 1 cc. of barium nitrate solution (*sulphate*); no coloration or precipitation on saturation with hydrogen sulphide (*salts of heavy metals*).

Incinerate about 1 Gm. of atoquinol, accurately weighed: the residue is not more than 0.1 per cent. Dissolve about 1 Gm., accurately weighed, in 50 cc. of previously neutralized alcohol; add 25 cc. of half-normal alcoholic potassium hydroxide solution; allow to stand for 30 minutes at 20 C., occasionally agitating and titrate the excess of alkali with normal hydrochloric acid, using phenolphthalein as an indicator: the amount of half-normal potassium hydroxide solution consumed corresponds to not less than 86 per cent nor more than 89 per cent, phenylcinchoninic acid.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 19, 1929

REACTIONS OF THE HEMATOPOIETIC SYSTEM TO INFECTION

An increase in the number of leukocytes of the peripheral blood is so frequent a manifestation of infection that infection must always be sought when the leukocyte count is raised above the normal average. Usually the number of the polymorphonuclear neutrophils is augmented, both relatively and absolutely. Arneth, Schilling and others have attached significance to the increase in the proportion of young polymorphonuclear neutrophils in the hyperleukocytosis of infection; even myelocytes may appear in the peripheral blood. The occurrence of young granular leukocytes and of myelocytes outside the bone marrow indicates not merely that the hyperleukocytosis is a matter of altered distribution of the circulating leukocytes but that these cells are produced in increased numbers in the hematopoietic system as the result of reaction to the stimulus of the infection. A sudden increase in the number of young, undifferentiated precursors of the granulocytes and their persistence characterizes certain forms of acute leukemia, the clinical similarity of which to acute infectious processes has been recognized and much discussed. In acute tonsillitis and cervical lymphadenitis of children, the hyperleukocytosis may be due chiefly to large mononuclear cells, and a similar state of the peripheral blood has given the name to the disease termed infectious mononucleosis. In pertussis, lymphocytosis may be a striking phenomenon.

In certain infectious diseases, such as typhoid, tuberculosis, syphilis and measles, the absence of hyperleukocytosis, which is the rule, is of differential diagnostic importance, as is the leukopenia or actual decrease in the number of leukocytes in still other diseases, of which uncomplicated influenza is the best example. The absence of a definite hyperleukocytosis in diseases such as lobar pneumonia and peritonitis, in which the degree of increase is of diagnostic significance, assumes grave prognostic import, since it indicates inadequate reactivity on the part of the body to the infection. Failure of the protective hyperleukocytic reaction on the part of the hematopoietic tissues was the explanation given in 1888 by Ehrlich of a case of staphylococcemia with leukopenia. Following him, other writers from time to time presented case reports of acute infectious processes with leukopenia, but laid greater stress on the decrease in the number of erythrocytes that was noted. In such cases, toxic hemolysis seemed more striking than leukopenia, and active destruction of elements of the blood more important than mere passive failure of the hematopoietic tissues to react. Infection with a decrease in the number of blood leukocytes, which had been a matter of isolated case reports, assumed greater importance in 1922, when W. Schultz of Berlin attempted to separate out from the group, as a more or less definite disease entity, a series of cases characterized by an acutely developing, necrotizing or gangrenous pharyngitis or tonsillitis, and by a rapid decrease in the number of leukocytes with almost complete disappearance of granulocytes, these changes being associated with inflammatory lesions of the intestinal tract or vagina similar to those of the pharynx. Emphasizing the decrease in the number of granular leukocytes, he proposed agranulocytosis and agranulocytic angina as descriptive of the process. Since the announcement by Schultz, a surprising number of cases of agranulocytosis have been reported. Although the rapidly developing leukopenia is one of the most striking elements in agranulocytosis, cases as typical as those first described have shown other changes equally important. A degree of hemolysis sufficient to cause visible icterus is not uncommon in cases otherwise characteristic. The frequent tendency to hemorrhage, either from the ulcerated mucous membranes or into the skin and serous membranes, may be associated with a decrease in the number of blood platelets, and an actual diminution in the number of lymphocytes takes part in the leukopenia. Although decrease in the number of granulocytes is the most significant hematologic change in agranulocytosis, the other formed elements of the blood are also diminished in number.

Philiptschenko [1] of Leningrad has presented a hematologic and microscopic study of three cases of acute infection which, according to the prevailing criteria, belong in the agranulocytosis group. In one patient, coming under observation in a moribund condition, the leukocytes were so few that they could not be enumerated in the hemacytometer but had to be estimated from stained preparations. The erythrocytes had been reduced to 2,080,000, the hemoglobin to 48 per cent, and the platelets to 2,800. In a second case, under observation for eight days before death, a fall in the leukocytes from 3,000 to 980 was associated with a drop in the erythrocytes from 3,120,000 to 1,400,000, and a terminal platelet count of 4,500. Anatomic study

1. Philiptschenko, H.: Zur Frage der Panmyelophthise (E. Frank) und Agranulocytose (W. Schultz), Ztschr. f. klin. Med. **110**: 437 (April 20) 1929.

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revealed absence of myelopoiesis and erythropoiesis in the bone marrow; disappearance from the marrow of megakaryocytes, the precursors of the platelets; absence of lymphopoiesis in the lymphoid tissues, and activation of the reticulo-endothelial system, as shown by increased phagocytosis of fragmented red blood corpuscles. Although cases of this kind will probably continue to be known as agranulocytosis, Philiptschenko points out that E. Frank, in 1915, seven years before the appearance of the article by Schultz, described such a condition under the name of panmyelophthisis, an unwieldy term but one more descriptive of the complete failure of formative reaction on the part of the hematopoietic tissues than is agranulocytosis. Whatever the name, it is apparent that the process concerned is more fundamental than a mere destruction of already formed elements of the circulating blood. The failure of the hematopoietic system to react to the infection is apparently not a matter of the species of infecting organism, since staphylococci, streptococci, pneumococci and other species of bacteria have been isolated from different cases. It may be a matter of the particular infecting strain, in which case it will remain to be determined what the various strains have in common that manifests itself in inhibition of the formative reaction of the hematopoietic tissues. The failure to react may be a constitutional peculiarity of the human individual. In this case the state must be a temporary one, since those who succumb to agranulocytosis must undoubtedly have reacted favorably to previous infections.

ACTIVITIES OF THE U. S. FOOD, DRUG AND INSECTICIDE ADMINISTRATION

A score of years has passed since the Food and Drugs Act became a part of the basic law of the United States. The exploitation of nostrums is more difficult; out and out frauds are less common. As usual, immediately after the act became effective, government forces were vigilant and were able to keep pace with the performances of quackery. Gradually the energy and activity of government officials seemed to lessen. In fact, the increasing amount of "patent medicine" analyses and exposés which THE JOURNAL undertook and published from 1910 to 1920 was witness to the decreasing efforts of the government. Meanwhile, conditions were changing; new drugs and new uses for drugs were being developed constantly, with increasing opportunity for imposition on the public. During the last two years there has been evidence of renewed activity by the government in protecting the public against exploitation. A few years ago a reorganization was effected by which the Bureau of Chemistry of the Department of Agriculture was divided into a bureau for chemical investigation and a separate Food, Drug and Insecticide Administration. THE JOURNAL has noted with gratification the increased activities of the latter bureau.

The Food, Drug and Insecticide Administration suggests that more dependence may be placed on antiseptics for human and animal use than was the case three years ago, or even three months ago. More than a thousand antiseptics have been investigated: mouth washes, douche powders, suppositories, liniments, tooth pastes and others. A survey by government officials revealed that few manufacturers had ever tested the antiseptics bacteriologically. Most of these preparations were found to be entirely nonantiseptic, or were recommended for use in dilution too weak to have effect on bacteria. In fact, two of the so-called antiseptics examined actually contained living bacteria. When the manufacturers were requested to label their products in compliance with the law, the majority, it is reported, complied. Some revised the claims; others "changed the formula"; forty-five manufacturers removed their antiseptics from the market altogether; in twenty cases it was necessary to resort to legal action.

The scientific attitude taken by the Department of Agriculture with reference to antiseptic action is of interest particularly to those familiar with medical science. To quote from a recent announcement,

> it has been the unchanging stand of the administration . . . that the important factor in deciding whether an antiseptic should kill bacteria or simply prevent their growth depended upon the length of time the product would be in contact with the body. Such products as mouth washes, douches and gargles as used are in contact with the body for but a few seconds, and therefore can only be considered antiseptic if they kill bacteria in the dilutions recommended and in the length of time they are in contact with the body. Salves, ointments, dressings and other products in contact with the body for prolonged periods of time may properly be called antiseptic if they merely prevent the growth of bacteria.

This bureau of the Department of Agriculture has also recently investigated ether for anesthesia. Not only has it published procedures for increasing the purity of ether but, as was reported recently in THE JOURNAL, it has seized a considerable amount of ether which was found to be substandard.[1] It has turned its attention to certain widely advertised "patent medicines," bringing charges of fraud against a number of the "best sellers." For instance, Anacin, exposed in THE JOURNAL years ago and more recently by the *Journal of the American Dental Association*,[2] has been the subject of a number of notices of judgment in which the U. S. Department of Agriculture charged misbranding in violation of the Food and Drugs Act, and declared the claims false and fraudulent. Such energetic and active administration of the law on the part of the bureau has been needed for some time. The officials and workers in the Food, Drug and Insecticide Administration of the Department of Agriculture merit the commendation and support of the medical profession.

1. Watching the Ether Supply, General News, J. A. M. A. **93**: 856 (Sept. 14) 1929.
2. Anacin: Imposing on the Public Through Unthinking Dentists, J. A. Dental A., June, 1929, p. 1121.

THE TEACHING OF LEGAL MEDICINE IN THE UNITED STATES

Oertel[1] of McGill University has made the following statement relative to the meaning of the term legal medicine: "The term 'legal medicine' is employed with different meanings. The most common definition is that it is the application of expert medical knowledge to the needs of law or justice. In this definition is embraced, not only criminal law, but the application to all kinds of insurance (life and accident), employees' compensation acts, soldiers' rehabilitations, and other civil procedures. A second rarer definition applies the term to the social and legal position and relations of the physician himself, that is, his rights, duties, obligations, and responsibilities to the community and to his fellow practitioners, and how the laws of the country affect him in the pursuit of his professional practice. The first of these definitions, therefore, puts the emphasis on the expert medical aspect, the second on the personal and legal side." It is in the first of these that legal medicine, in certain continental European countries, has become a highly specialized subdivision of medicine, uniting within itself those elements of the medical sciences that are essential to criminal justice.

In a country which, like the United States, depends on the antiquated elective coroner system for such expert aid as medicine can render to law and justice, not much can be expected in the development of legal medicine as a specialized branch of medical knowledge. This poor expectation finds its realization in the status of legal medicine in relation to criminal justice and in the teaching of the subject in the medical schools of America. Only a few physicians have attained standing as experts in legal medicine, including especially those who have had the advantage of working full time under the medical examiner system, in the few localities where this system prevails. Other than these, the physicians who have gained recognition as experts have done so through continued service as coroners' physicians, serving often because of devotion to public duty rather than because of the emolument received or of any honor that pertains to the often thankless position of coroner's physician. Neither the coroner system nor the medical examiner system, in the absence of institutes of legal medicine, can offer training to the physician who might wish to qualify as an expert in legal medicine. The backward state of the science is further attested by a lack of published scientific work and of special journals in which such work might be published, even if it were done. It is true that the *Medico-Legal Journal* is published in New York and the *Transactions of the Medico-Legal Society of Massachusetts* appear in a series of volumes, but these are not to be compared with the journals of forensic medicine and criminal anthropology published in Germany, Italy and France.

Concerning the teaching of legal medicine, the report[2] of the National Research Council on "The Coroner and Medical Examiner" says: "The teaching in the medical schools of the first rank in the United States of that part of medical science which has to do with the work of the coroner or medical examiner reflects the general state of forensic medicine." Examination of the announcements of courses issued by such schools reveals that what is usually taught as forensic medicine or medical jurisprudence is the subject matter of the second of Oertel's definitions; namely, "the social and legal position and relations of the physician himself." The teaching given is most often assigned to a department which covers a miscellany of subjects of supposedly minor importance, such as medical history, ethics and economics, although in a small number of schools it falls within a major department, such as hygiene and sanitation or chemistry. A few schools make no specific mention of the teaching of legal medicine, and a few others state that the legal aspects of medicine are considered in connection with other courses, usually obstetrics, pathology, toxicology and clinical microscopy. Only one school refers specifically to teaching whose aim it is to fit the student for such duties as he might be called on to perform as coroner. The time devoted to the subject varies from a total of eight to thirty-six hours, one hour a week for one quarter, trimester, or half or whole semester.

"It appears extremely doubtful," says the National Research Council's report,[2] "that a comprehensive course in forensic medicine belongs in the regular medical curriculum. The student should have some knowledge of his own legal rights and duties as a physician, and he should perhaps have an outline of the relation of his profession to criminology. More detailed and specific training, which would fit him for the duties demanded of the coroner or medical examiner, should require postgraduate study in an institution organized for such work. Training for the career of medical examiner . . . would demand an amount of time which cannot be fitted into the regular curriculum and a degree of specialized training which is not the aim of the four-year medical course." The elective coroner system offers no inducement to the graduate in medicine to fit himself for a career in legal medicine. The widespread adoption of the medical examiner system, the advantages of which, as a part of the machinery of criminal justice, are acknowledged, would create a necessity for men trained in the specialized field of legal medicine which could not be met by the present supply or by the teaching at present given in the subject. A situation would arise which would be analogous to that which followed the recognition that sanitation and hygiene are matters of vital import to the public. The demand for full-time public health officials adequately trained in sanitation and hygiene necessitated the

1. Oertel, Horst: Academic Position of Legal Medicine in Canadian Universities, in Methods and Problems of Medical Education, series 9, New York, Rockefeller Foundation, 1928, p. 23.

2. Schultz, O. T., and Morgan, E. M.: The Coroner and the Medical Examiner, Bull. 64, National Research Council, Washington, 1928.

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establishment of institutes and of enlarged university departments of hygiene. If the medical duties demanded of the coroner were in the hands of properly qualified medical examiners, serving continuously under civil service, their training would require a complete reorganization of the present teaching of legal medicine and the development of institutes of legal medicine, in which the teaching of the necessary variety of subjects could be correlated and in which research would lead to the further progress of legal medicine.

Current Comment

SICKNESS IN POVERTY

The impression prevails among practicing physicians that sickness is most common among those least able to afford it. Scientific and statistical confirmation of this belief is available in the latest report of the morbidity studies of the Public Health Service at Hagerstown, Md.[1] Some 1,800 households visited in 1921 were classified according to economic status. The classification was checked by ten members of the research staff. Other members proceeded, during the following twenty-eight months, to make an inventory of all sickness occurring in these households. The illness rates, corrected for age, during this period were as follows: well-to-do, 991 per thousand; moderate, 1,068; and poor, 1,113. Analysis by age groups shows that these differences tend to disappear in adolescence and old age, being most marked in middle age. In early infancy the order of morbidity is reversed, the children of the wealthier parents suffering more sickness than those of the poor. A satisfactory explanation is not offered for this observation. From a study of the printed curves one gains the impression that it is a distinct advantage to be able to treat with proper respect and leisurely convalescence the acute disabilities of middle age, such as rheumatic, influenzal and respiratory infections. One aspect of the study gave quite definite results: "Those families which were definitely above the average of this community in economic condition had medical attention to a considerably greater extent than the remainder of the population."

THE PHYSIOLOGY OF DRAINAGE OF THE SINUSES

Many human weaknesses, among them liability to infection of the sinuses, have been attributed to the erect human posture. The lower animals, it is claimed, are less liable to such infection because their posture secures for them better drainage. This widely accepted opinion has recently been challenged. Thus Baum[2] questions whether the lower animals have much advantage in posture and in the second place whether posture is the important factor in drainage that it is generally supposed to be. Many of the lower animals may be seen reclining with the muzzle stretched flat on the ground. True, they change from time to time the posture of their heads, but so also does man when he shaves his chin in the morning, when and if he says his prayers at night, and often in between. Moreover, if all the facial sinuses are considered, those which drain most nearly in the vertical position are not found in experience to be most immune to disease. Rather it seems to be the sinus with a large ostium that offers the most ease of ingress to nasal infection and becomes most frequently infected. Of much greater importance than gravity, in Baum's opinion, is the action of the cilia that line the sinuses as well as the nasal passages. By their steadfast action, the secretion and débris are swept outward toward the ostium. When, through pathologic conditions, the ostium becomes occluded or the cilia themselves are destroyed, this natural method of sweeping the sinus floor fails. Obviously the surgery of the sinuses should be conservative, seeking to restore rather than to replace nature's not imperfect art.

1. Sydenstricker, Edgar: Economic Status and the Incidence of Illness, Pub. Health Rep. **44**: 1821 (July 26) 1929.
2. Baum, H. L.: Some Practical Considerations in the Problem of Sinus Infection and Drainage, Ann. Otol., Rhin. & Laryng. **38**: 152 (March) 1929.

THE SITE OF UREA FORMATION

As more than four fifths of the nitrogen that is taken into the body in the form of nutritive compounds is ultimately eliminated through the kidneys as urea, the site and mode of formation of the latter have naturally awakened interest. There were several reasons, some of them indirect, that were early advanced to demonstrate that the liver plays a dominant part in the production of the foremost end-product of nitrogenous metabolism in the body. Urea is found in almost all of the tissues in some quantity, however, so that it became necessary to ascertain whether its presence in these parts—the muscles, for example—is due to synthesis there or to transfer from other organs. The extreme solubility of urea in the fluid of the organism and its ready diffusion through animal membranes help to account for its ubiquity. Five years ago a group of investigators[1] at the Mayo Clinic succeeded in removing both the liver and the kidneys through surgical procedures from animals that survived for some time. The resultant anuria did not lead to any accumulation of urea in the blood; in fact there was convincing evidence that without the liver urea was not formed in the body. Obviously such an experiment cannot be repeated on man; but the occasional unfortunate "experiments" of nature in the field of human pathology give opportunity for observations quite as cogent as those specifically devised to answer a given question. Thus, Rabinowitch[2] of the Montreal General Hospital has lately had occasion to examine a patient in whom idiopathic acute yellow atrophy of the liver destroyed practically all of the functional hepatic cells. Furthermore, a degenerative nephritis had produced almost complete suppression of urinary function. In spite of the latter there was no urea in the blood. The evidence from this rare case in man thus supports the current view that urea is formed exclusively in the liver. As might be expected, further, there was a marked hypoglycemia.

1. Bollman, J. L.; Mann, F. C., and Magath, T. B.: Am. J. Physiol. **69**: 371 (July) 1924.
2. Rabinowitch, I. M.: Biochemical Findings in a Rare Case of Acute Yellow Atrophy of the Liver, J. Biol. Chem. **83**: 333 (Aug.) 1929.

Association News

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock, Central Standard Time, with the exception of Friday, when the health message is delivered at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of October 21-26 is as follows:

October 21. "The Old Medicine Chest," by Dr. R. G. Leland.
October 22. "Some High Spots in Fifty Years of Medical Progress," by Dr. J. O. Nall.
October 23. "The New Foster Mother," by Miss Mildred Whitcomb.
October 24. "Supply of Physicians in Rural Communities," by Dr. N. P. Colwell.
October 25. "Clean Workers Means Clean Food," by D. R. G. Leland.
October 26. "Nothing but a Cold," by Dr. R. G. Leland.

Evening Health Hints from Hygeia, 8 o'Clock, Central Standard Time

October 21. Avoid Home Remedies in Cancer.
October 22. What Can Be Done to Prevent Cripples.
October 23. Defective Ear Drums May Cause Drowning.
October 24. Checking Up on Your One Year Old.
October 25. Chinese Pay Doctor in American Way.
October 26. Whooping Cough Is Serious.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DELAWARE

Health at Wilmington.—Telegraphic reports to the U. S. Department of Commerce from sixty-three cities with a total population of about 29 million, for the week ending October 5, indicate that the lowest mortality rate (7.7) was for Wilmington, and that the mortality rate for the group of cities as a whole was 11. The mortality rate for Wilmington for the corresponding week last year was 11.4 and for the group of cities, 12.3.

DISTRICT OF COLUMBIA

Personal.—Frank H. Chittenden, Sc.D., for many years with the bureau of entomology, U. S. Department of Agriculture, died suddenly, September 15, aged 70.

National Institute of Psychology Incorporated.—This organization has been incorporated in Washington by Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service; Knight Dunlap, Ph.D., Johns Hopkins University, Baltimore, and Edwin E. Slosson, Ph.D., of Science Service. The object, the Washington *Star* says, is to found a national psychologic laboratory, similar in some of its functions to the bureau of standards, but not under federal control, to undertake programs of research too lengthy and complicated for other institutions. The institute desires to locate in Washington because of the exceptional facilities for research and the opportunities to cooperate with universities and other organizations. The active members include about fifty experimental psychologists. The financial plans are incomplete.

GEORGIA

A Ton of Yeast for Pellagra.—The Georgia State Board of Health has a ton of dry brewers' yeast for sale to organizations and individuals for use in the treatment and prevention of pellagra. The yeast is in 5 pound bags costing $1.50, plus parcel post charge, which at the most is only 18 cents. All orders for yeast should be addressed to the laboratory of the state board of health at Atlanta. For the last five years the prevalence of pellagra in Georgia has increased 250 per cent and the increase in deaths in the first six months of 1929 over the same period of 1928 was 11.4 per cent.

Society News.—Dr. Gordon Chason, Bainbridge, addressed the Tri-County Medical Society, Colquitt, September 11, on "Significance of Abdominal Pain."——The Jefferson County Board of Health has appointed Dr. W. K. Stewart, Union Point, county health officer. He will assume charge of the work in November.——The Fulton County Medical Society, Atlanta, was addressed, October 3, by Dr. William P. Nicolson, Jr., on mastitis. This society and the Fifth District Dental Society maintain their own collection service called the Physicians' and Dentists' Credit Bureau, Inc., which, during its first ten months, collected $15,978. Eighty-seven members turned out for the annual golf tournament of the Fulton County Medical Society, September 25.——Dr. Robert A. Berry has been appointed health officer of Troup County to succeed Dr. Silas C. Rutland.

ILLINOIS

Personal.—Dr. Henry L. Davis, Rockford, was elected surgeon general of the United Spanish-American War Veterans at the recent national convention in Denver.——Dr. Worling R. Young, Geneseo, has accepted a position at Madison, Wis., in the health department of the state university.——Dr. Phillip S. Waters, Alton, has been appointed managing officer of the Lincoln State School and Colony to succeed Dr. Christian H. Diehl, resigned.——Dr. Walter C. Bisson has been appointed postmaster of Charleston, Ill. Dr. Bisson served with the one hundred and thirty-first infantry of the thirty-third division in France and took part in the Meuse-Argonne campaign and the Somme campaign.

Chicago

Dr. Adair Comes to University of Chicago.—Dr. Fred L. Adair, professor of gynecology and obstetrics, University of Minnesota Medical School, Minneapolis, has accepted the chair of gynecology and obstetrics at the University of Chicago Medical School. Previous to his departure from Minnesota, Dr. Adair was guest of honor at a number of dinners given by his associates. He is a graduate of Rush Medical College, has done graduate work in Europe, was in general practice for several years before specializing and since 1905 has been on the faculty of the University of Minnesota. He served in the World War, is a past president of the Hennepin County Medical Society, is secretary of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, and the author of many articles in medical journals concerning his specialty. His appointment marks the opening of this department at the south side school.

IOWA

Society News.—Dr. Everett D. Plass, Iowa City, has been elected president of the Missouri Valley Medical Society. The next annual meeting will be in Des Moines in 1930.——The Webster County Medical Society, Fort Dodge, was addressed, September 17, by Dr. Thomas R. Gittens, Sioux City, on bronchoscopy and esophagoscopy.

Dr. Rowan Returns to the University.—Dr. Charles J. Rowan, formerly head of the surgery department of Iowa University College of Medicine, Iowa City, rejoined the faculty this fall, it is reported, as professor of clinical surgery. Dr. Rowan resigned from the department in 1927; his successor, Dr. Howard L. Beye, will continue as head of the department.

KENTUCKY

Society News.—Dr. William D. Haggard, Nashville, addressed the Christian County Medical Society, September 17, at Trenton on "Diagnosis of Cancer."——Dr. John William Armstrong, Berea, addressed the Bourbon County Medical Society, September 26, on scarlet fever.——At a meeting in Clay, October 8, the Webster County Medical Society discussed the treatment of paralysis, and the newer anesthetics; among the guests were Drs. Justice Wynn and John W. Visher of Evansville, Ind. The next meeting will be at Dixon the first Tuesday in November.

Three Distilleries Authorized to Make Bourbon.—Commissioner of Prohibition James M. Doran, Washington, D. C., has announced that permission has been granted to three distilleries to manufacture Bourbon whisky, in accordance with the law, for renewal of the medicinal whisky stock of the country. This is the first time since 1921 that distilleries are to be operated lawfully in the United States. The permits were granted to the American Medicinal Spirits Company of Louisville, Ky., the Frankfort Distilling Company of Louisville, and the Glenmore Distilling Company of Owensboro, Ky. Dr. Doran stated that permits for the manufacture of rye whisky will be granted at a later time; it was imperative that

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early distillation of Bourbon whisky be started because of the steadily decreasing medicinal supply now held in bonded warehouses.

LOUISIANA

Society News.—Dr. Herbert H. Unsworth, New Orleans, director, state bureau of mental hygiene, addressed the Louisiana Public Health Association at Alexandria, September 20, on "Emotionalism and Its Effects on the Developing Child." ——Dr. Morgan Smith, Jennings, has been reelected president of the Seventh District Medical Association.

Health at New Orleans.—Telegraphic reports to the U. S. Department of Commerce from sixty-three cities with a total population of about 29 million, for the week ending October 5, indicate that the highest mortality rate (17.2) was for New Orleans, and that the mortality rate for the group of cities as a whole was 11. The mortality rate for New Orleans for the corresponding week last year was 18 and for the group of cities, 12.3. The annual rate for sixty-three cities for the forty weeks of 1929 was 13.1, as against 12.9 for the corresponding weeks of 1928. Caution should be used in the interpretation of these figures, as they fluctuate widely. The facts that some cities are hospital centers for large areas outside the city limits or that they have a large negro population may tend to increase the death rate.

MARYLAND

Personal.—Dr. Walter N. Thayer, Jr., has been appointed superintendent of all state prisons in Maryland, effective November 1. Dr. Thayer has been superintendent of the New York State Institution for Defective Delinquents at Napanoch. ——Dr. Hugh H. Young entertained civic and industrial leaders interested in air craft at dinner, October 11. Dr. Young, who is chairman of the state aviation commission, recently made a tour of airports in Europe.

Professor Warburg Will Give Herter Lectures.—The trustees of Johns Hopkins University, Baltimore, announce that Prof. Otto Warburg of the Kaiser Wilhelm Institute, Berlin, Germany, will give the nineteenth course of lectures of the Herter Foundation, October 19, on "The Enzyme Problem and Biologic Oxidations." This lectureship was endowed in 1902 by Dr. and Mrs. Christian A. Herter of New York to promote a more intimate knowledge of the researches of foreign investigators in the realm of medical science.

Training Unusual Chemistry Students.—Francis P. Garvan, the president of the Chemical Foundation, New York, has endowed a chair of chemical education at Johns Hopkins University, Baltimore, which was dedicated, October 11. At the same time a plan was inaugurated to provide eventually for the training of exceptional students from each state. So far, there are nineteen such scholarships available and they have been provided by industrial concerns, research foundations and individuals. Joseph S. Ames, LL.D., president of Johns Hopkins, in inaugurating the scholarship plan, said that there is a conviction that the hope of the future advancement in science lies not in the average student but in the student of exceptional ability and character, and that our educational system must provide for the complete utilization of the unusually gifted student. The first to hold the Garvan chair for chemical education at Johns Hopkins University is Neil Gordon, Ph.D., for many years professor of chemistry at the University of Maryland. At the ceremony acknowledgement was made of gifts totaling $500,000 as a nucleus to be devoted to the training of chemists.

Society News.—Johns Hopkins University School of Medicine opened the fall term, October 1, with seventy-one freshman students enrolled from many parts of the United States and China and France. There are seventy-three students in each of the second and third year classes and seventy in the fourth year class, making the total enrolment 287.——The Medical and Chirurgical Faculty of Maryland has appointed a committee on economics for the purpose of suggesting remedies for various situations arising from either free treatment for those able to pay or the failure to pay hospitals and physicians for service rendered. Many physicians are said to have complained of the encroachment of the department of health on their practice, and that insurance companies and attorneys have too frequently made settlements for injuries without compensating the hospital and physician. The chairman of the committee of medical economics is Dr. G. Milton Linthicum. The Medical and Chirurgical Faculty of Maryland will hold its semiannual meeting at Point Lookout, October 22-23. Among the speakers will be Drs. Francis J. Kirby on "Foreign Bodies in the Elbow Joint"; Lay Martin, "Effect of Nonspecific Desensitization in the Treatment of Disease," and Herbert Schoenrich, on "Consideration of the Venereal Diseases in General Practice."——A symposium on ringworm was held, October 4, by the Baltimore City Medical Society; Drs. Morris Goodman spoke on classification and demonstration of common fungi; Leon Ginsberg on clinical manifestations and differential diagnosis; Llewellyn W. Lord, treatment, and Lloyd W. Ketron, prevention. The society has organized a urologic section with Dr. Hugh H. Young president.——A group of Japanese physicians, headed by Dr. S. Sawamura, chief surgeon of the Red Cross Hospital, Osaka, visited the Johns Hopkins University School of Medicine, September 29-30.

MINNESOTA

Society News.—Prof. George V. Volborth, for many years assistant to Professor Pavlov, and Prof. Z. A. Orbeli, professor of physiology, Medical Institute, Leningrad, Russia, lectured at the Mayo Foundation, Rochester, September 26-27, on "Conditioned Reflexes" and "Studies on the Function of the Sympathetic System," respectively.——The Memorial Cancer Institute of the University of Minnesota, during the annual meeting of the American Public Health Association in Minneapolis, conducted an exhibit calling attention to the need of early diagnosis in cancer, and exhibited the Canti Cancer Film. ——Dr. Everett K. Geer presented a thesis before the Minnesota Academy of Medicine at the Town and Country Club, October 9, on "Evulsion of the Phrenic Nerve for Pulmonary Tuberculosis."——Dr. Charles Dexter Lufkin, St. Paul, has been appointed assistant superintendent of the Kula Sanatorium on the island of Maui, Hawaii.

Radio Health Service.—The report of the radio committee of the state medical association, as noted in *Minnesota Medicine*, indicates that radio health service is making the people of the Northwest "health-conscious." From April 3, 1928, to April 30, 1929, Dr. W. A. O'Brien, assistant professor of pathology, preventive medicine and public health, University of Minnesota Medical School, gave a weekly fifteen-minute talk on selected medical topics, the majority of which have been requested by the radio audience of Station WCCO. As a result of the excellent response to the programs, the service has been enlarged to include a five-piece orchestra which precedes and follows the talks. Some subjects discussed over the radio were "Rest and Sleep"; "Maternal and Infant Hygiene"; "The Cause of Cancer"; "Correcting Nature's Mistakes"; "Conquest of Tuberculosis"; "Tularemia—A Disease of Man and Animals," and "Outlook for the Young Diabetic."

NEBRASKA

Society News.—The Lancaster County Medical Society, Lincoln, was addressed, September 24, by Dr. Henry W. Cattell, Philadelphia, on "The Personality of William Osler," and at the October meeting by Drs. Wesley C. Becker and Artemas I. MacKinnon on cause and prevention of intracranial birth injury, and clinical observations in appendicitis, respectively. The meeting, November 5, will be addressed by Dr. Charles W. M. Poynter, Omaha, on "Experimental Studies of the Peritoneum," and that of November 19 by Dr. Louis E. Moon, Omaha, on "Symptoms Which Should Call for a Rectal Examination."

NEVADA

Hosts of Spotted Fever Ticks.—Rocky Mountain spotted fever is transmitted among rodents and some small carnivorous animals in the Rocky Mountain region and adjacent areas by two species of ticks, *Dermacentor andersoni* Stiles, a wood tick, and *Haemaphysalis leporis-palustris* Packard, a rabbit tick. Parker says in the Bulletin of the Nevada State Board of Health that human infection results from the bite of the former. Both ticks feed on a separate host in each successive stage in the life cycle—larva, nymph and adult. The wood tick or the spotted fever tick feeds on a variety of hosts, including several kinds of squirrels, rabbits, the wood rat, prairie dogs, badgers and weasels. The rabbit tick occurs only in various species of rabbits and on game birds. Parker says that Rocky Mountain spotted fever, up to July 1, 1928, had occurred in 171 counties in the Rocky Mountain region, while up to 1914 it had only been known in seventy-eight counties. To what extent this represents a spread of the infection is difficult to say, as cases may have occurred long ago in the additional counties that were not reported. For example, it was found by Dr. F. E. Becker that spotted fever had occurred in Lake County, Colorado, as long ago as 1885. It is apparent, Parker says, that the infection has spread, and that no extensive spread took place in eastern Montana before 1914; it was then definitely known in only one county; now it is present in twenty-five. *Dermacentor andersoni* not only is the immediate source of infection for Rocky Mountain spotted fever but is responsible

also for tick paralysis in man, and is a potent agent of tularemia infection in man and of tick paralysis in cattle, horses and sheep. For five seasons the U. S. Public Health Service at its station in Hamilton has been preparing a vaccine against spotted fever. In that time there were seven persons who contracted the disease while working at the public health laboratory. Twelve cases with one death have occurred among vaccinated individuals and twenty-two cases and seventeen deaths among unvaccinated individuals. Previous to the use of the vaccine, all laboratory workers who contracted the infection died. A unique phase of the problem is that the virulence of the infection in any given locality is reasonably constant. The areas of greatest virulence are on the west side of the Bitter Root Valley in western Montana; a small section on Kirby Creek near Thermopolis in Hot Springs County, Wyoming, and an area in the Wind River mountains in Fremont County, Wyoming. The mortality in these sections not infrequently reaches from 80 to 100 per cent. The mildest infection is in the Snake River Valley in southern Idaho, where the mortality seldom exceeds 5 per cent. Ambulatory cases are not uncommon in southern Idaho and eastern Oregon. In Nevada, in the period 1903-1926, there were 127 cases with a mortality of 11.81 per cent reported.

NEW YORK

Hunting Trip to the Adirondacks.—The Baltimore Medical Club of New York, whose members are graduates of Baltimore medical schools, is arranging a hunting trip to the Adirondack Mountains, leaving New York November 1 and returning November 5. Further information may be had from the secretary, Dr. Joseph S. Stovin, 160 West Eighty-Seventh Street, New York.

Changes in Long Island Faculty.—With the opening of the seventy-first year of the Long Island College Hospital, Brooklyn, the following changes in the faculty were announced: Dr. Jean R. Oliver, formerly professor of pathology, Stanford University School of Medicine, to be professor of pathology; Dr. Clayton J. Sharp, formerly with the Columbia University College of Physicians and Surgeons, to be assistant professor of anatomy; Drs. Daniel M. McCarthy and James Pullman to be clinical professors of medicine; Dr. Alec N. Thomson to be assistant professor of preventive medicine and hygiene; Drs. Hector W. Benoit and William M. Ennis to be assistant clinical professors of surgery; Drs. George Kornfeld and Arthur E. Soper to be associates in obstetrics and gynecology and neurology, respectively. At the opening exercises of the fall term, Dr. Emil Goetsch, head of the department of surgery, gave an address on "The Goal of the Medical Student."

Society News.—At the annual meeting of the Columbia County Medical Society, October 1, Dr. Nathan D. Garnsey, Kinderhook, gave an address on "The Question of Needing Visiting Nurses Throughout the County, Provided at Public Expense."——Dr. Frank Smithies, Chicago, addressed the Rochester Academy of Medicine, October 2, on "Deficient Liver Function as a Cause of Chronic Skin Lesions."——Westchester County has appropriated $2,150,000 for the construction of a tuberculosis hospital and children's pavilion adjoining the present county hospital at Grasslands.——The *New York State Journal of Medicine*, October 1, has an interesting summary of the third annual conference of secretaries of county medical societies held in Albany, September 10, on the topic "How to Arouse Interest in County Medical Societies." Seventeen secretaries were present.——Dr. Shirley W. Wynne, health commissioner of New York City, addressed the Third District Branch Medical Society, recently, on "The Medical Profession, Economically Speaking." Dr. Wynne's efforts to have practitioners do the treatment that has been done by health departments have become noteworthy. He said that the five county medical societies are not well organized to carry on preventive medicine activities which properly belong to physicians and that they are prone to leave this type of work to official departments and lay agencies. The pediatricians are an exception to this rule. The city department of health, Dr. Wynne added, is almost compelled to conduct clinics for treating cases, but the department will close its treatment clinics as fast as the practitioners themselves will give the treatments.——The Wesley M. Carpenter lecture of the New York Academy of Medicine was given, October 17, by Dr. Charles P. Emerson of Indiana University School of Medicine on "Function of Emotions in Production and Prognosis of Diseases." The section on medicine of the academy held a symposium on anemia, October 15, by Drs. George H. Whipple, professor of pathology and dean, University of Rochester School of Medicine, Charles A. Doan, Rockefeller Institute for Medical Research, and William B. Castle, Thorndike Memorial Laboratory, Boston.

New York City

Sunshine Lost at Noon.—Letters come to the New York Health Department from cities throughout the country and from Europe requesting help in smoke abatement. New York has done away with 70 per cent of the smoke nuisance on Manhattan and 50 per cent on the rivers, the health commissioner says. Two years ago nearly sixty tugs were seen puffing smoke, but recently the health department could pick out only fourteen tugs in a day violating the smoke regulations. These were speedily controlled through the cooperation of the Tugboat Owners' Association. The department is going ahead to improve the situation with the cooperation of local organizations and scientists. Harvey N. Davis, president, Stevens Institute of Technology, has organized a New Jersey committee to cooperate with the New York committee. Prof. William J. Moore of the Polytechnic Institute, Brooklyn, is studying the smoke problem; Prof. H. H. Sheldon of New York University is making a three years' study of the problem, with regard to ultraviolet radiation and the dust count. Edward R. Weidlein of the Mellon Institute, Pittsburgh, is assisting the New York Health Department, and Dr. Davis is studying smoke prevention and the most workable ordinances in effect throughout the country. The National Conference Board on Sanitation, which maintains photo-electric cells at different places on Manhattan recording variations in light, is checking its records against those of a similar cell at Cedar Grove, N. J., which is beyond the smoke area. On the brightest day, the health commissioner says, New Yorkers lose as much as 45 per cent of the sun's light at noon by smoke. The unions cooperated last winter by sending men to instruct their members in smokeless stoking and care of furnaces. The health commissioner requests the earnest help of every citizen in further reducing the amount of smoke that hangs over New York.

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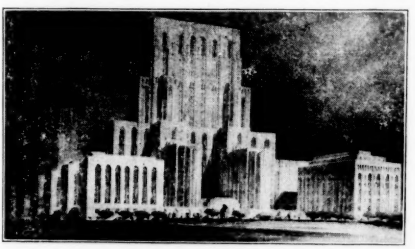
Another Medical Center — Thirteen Buildings. — The New York Hospital and Cornell Medical College Association filed plans for the new medical center, August 15, and construction is to begin at once. Dominating the group of thir-



teen buildings to be erected between Sixty-Eighth and Seventy-First streets along the East River will be a twenty-four story hospital. West of it will be the Cornell Medical College, and east of it a maternity hospital, a children's hospital and a hospital for mental and nervous diseases. The nineteen story nurses' home will be between Seventieth and Seventy-First streets, and in that block, also, will be the power plant, quarters for employees, garage and other service buildings. The entire plant, fireproof throughout, is designed to provide the most modern facilities for practically every service needed in the care of the sick, for research, the training of physicians, and the preparation of graduates for teaching positions. There will be beds for about 1,000 patients, accommodations for about the same number of outpatients a day, facilities to train about 300 undergraduate medical students, and a home which will accommodate about 500 nurses. The first eleven floors of the central building will be a general hospital; the twelfth to seventeenth floors will be a hospital for private patients, and the upper floors will be living quarters for resident physicians. The two southern wings of the general hospital section of the main building will be devoted to wards, one of the northern wings to outpatient work, and the other north wing to occupational treatment, hydrotherapy, physical therapy and chemotherapy and the roentgen-ray department. The main operating rooms will be on the tenth and eleventh floors. The private patient floors will be a self-contained hospital by themselves. The psychiatric institute flanking the main building and facing Exterior Street, will have 116 beds, and will collaborate with the Bloomingdale Hospital in treating the mentally ill, and in

teaching and research. The 156 bed institute for maternity cases which will be a memorial to the late Laura Spelman Rockefeller will take over the activities of the Lying-In Hospital. A third special institute is planned for the care of children, and teaching and research in children's diseases, but no special funds for its endowment have yet been provided. The 125 bed pediatric institute built between the maternity and the psychiatric institutes will be joined to the main hospital building. In the part of the central building which connects with the medical college buildings will be laboratories for research on problems most closely associated with the care of the sick. The pathology building of the medical college, which will face York Avenue immediately adjacent to the main hospital, will house also the central medical library and the administrative offices of the medical college. Extending from it will be four buildings for the departments of anatomy, pharmacology, biochemistry, bacteriology and physiology. The clinical department will have classrooms and laboratories throughout the hospital units. The New York Hospital-Cornell Medical College Association proposes to unify teaching and hospital work throughout the entire institution. The joint administrative board of the association, the chairman of which is Edward W. Sheldon, comprises three governors of the New York Hospital and three representatives of Cornell University; the seventh member is J. Pierpont Morgan. The executive officer of the board is Dr. G. Canby Robinson.

NORTH CAROLINA

Society News.—Dr. Glenn R. Frye, Hickory, was elected president at the annual meeting of the Ninth District Medical Society, September 26, in Hickory, and Dr. John H. Tucker, Charlotte, was made president of the Seventh District Medical Society at a meeting, October 8, in conjunction with the Mecklenburg County Medical Society in Charlotte. These two meetings were attended by about 100 and 200 physicians, respectively, and among the speakers were Drs. John T. Burrus, High Point; Hugh R. Black, Spartanburg, S. C.; Harris H. Bass, Durham; Lewis B. McBrayer, Southern Pines; William B. Porter, Richmond, Va., and Lester A. Crowell, Lincolnton. ——The Anne Penn Hospital at Reidsville, given to the city by C. A. Penn and Jefferson Penn as a memorial to their mother, is expected to be completed by April 1 at a cost of about $125,000.

Personal.—Dr. Thomas J. Sasser has been appointed school physician in the health department at Charlotte.——The president of the Medical Society of the State of North Carolina has appointed Drs. Russell O. Lyday, Greensboro, William C. Bostic, Forest City, and Ivan M. Procter, Jr., Raleigh, to represent the society at the eleventh decennial revision of the U. S. Pharmacopeia.——Dr. Walter R. Berryhill, Belmont, has been appointed to the faculty of the University of North Carolina School of Medicine.——The state board of medical examiners restored the license of Dr. Edwin H. Bowling, Durham, June 24, which had been revoked, July 18, 1925, following his conviction of violation of the Harrison Narcotic Act.—— Dr. John P. Monroe, who for years has conducted a private hospital at Sanford, was shot on the street, October 2, by a man supposed to be mentally deranged. It is believed that Dr. Mouroe will recover.——Dr. Clement R. Monroe has been appointed superintendent and resident surgeon of the Moore County Hospital, which will be opened about the first of December.

OHIO

Hospital News.—Ohio veterans of the World War gave to the village of Montfaucon, France, a hospital which was dedicated in the presence of 200 Ohioans of the thirty-seventh division, September 29. Montfaucon was completely destroyed during the battles around Verdun. A new village has been erected nearby.

Personal.—Dr. Ross M. Gault, Portsmouth, has accepted a position on the staff of the Children's Hospital, Philadelphia. ——Dr. James M. Phillips, for many years in charge of the Pasteur Laboratory in Columbus, has announced his retirement from active practice.——The Academy of Medicine of Cleveland was addressed, October 18, by Dr. Samuel W. Lambert, New York, on "Changing Aspects in Medical Practice," and by Dr. Vernon C. Rowland on "Present Status of the Periodic Health Examination."

Health Commissioner of Columbus Appointed.—The Columbus Board of Health announces the appointment of Dr. Nelson C. Dysart as city health commissioner to succeed Dr. James A. Beer who has resigned, effective January 1. Dr. Dysart has been chief of the division of communicable diseases and industrial hygiene of the city health department for several years and before that was with the state health department. He served in France during the World War. Dr. Beer has been with the Columbus health department for twenty-two years and has been commissioner since 1922. He was a member of the faculty of Ohio State University College of Medicine, and for ten years has been secretary of the Columbus Academy of Medicine.

Institution for Feebleminded at Apple Creek.—The governor of Ohio turned the first sod and delivered the address at ground-breaking ceremonies for the new institution for the feebleminded at Apple Creek in Wayne County, August 23. Governor Cooper recalled that Ohio in eighteen years has increased its population by 2,000,000, but in that time will have added only three institutions for the care of an increase of 12,000 state wards when the Apple Creek work is completed. Ohio, which now has 32,228 wards in twenty-four institutions, has in addition to these an option on 2,000 acres of land near Lebanon which, if satisfactory, will be purchased for an institution for the feebleminded in the southwest part of the state. The institution at Apple Creek will care for 450 inmates at first, and later it is expected to erect buildings to accommodate 225 more.

PENNSYLVANIA

Society News.—The Lycoming County Medical Society was addressed, October 11, at Williamsport, by Dr. Louis D. Englerth, Philadelphia, on "Osteomyelitis with Special Reference of the Orr Treatment." The society will be addressed, December 13, by Dr. John H. Stokes, professor of dermatology and syphilology at the University of Pennsylvania School of Medicine, on "Dermatology in Medical Diagnosis as Illustrated by the Skin Lesion of the Hands and Feet."

Prizes for Case Reports by Interns.—The Allegheny County Medical Society, Pittsburgh, again offers prizes of $25 and $15 for the two best case reports submitted by interns in any approved hospital in Allegheny County. The report shall be that of a case which has been under the care of the person reporting. It should comprise 800 words or less, and be mailed to the secretary of the county medical society, Jenkins Arcade, Pittsburgh, prior to April 1, 1930, with no direct means of identification on the manuscript. A separate envelop containing the intern's name, address and the name of his hospital should accompany the report.

Philadelphia

Dr. Fay Appointed Professor of Neurosurgery.—Dr. Temple S. Fay of the neurologic staff of the University of Pennsylvania School of Medicine has been appointed to the newly created chair of neurosurgery at Temple University School of Medicine. Born in Seattle, Dr. Fay graduated in medicine at Pennsylvania in 1921. He served during the World War, and has published many papers on neurologic subjects in scientific journals.

Society News.—Dr. Patrick A. McCarthy addressed the Philadelphia Academy of Surgery, October 7, on "Treatment of Intrathoracic Aneurysm by Distal Arteriovenous Anastomosis."——Dr. Joseph McFarland addressed the Pathological Society of Philadelphia, October 10, on "The New Bureau for the Study of Tumors" (THE JOURNAL, August 3, p. 389).—— Dr. Arthur J. Bedell, Albany, N. Y., addressed the ophthalmologic section of the Philadelphia College of Physicians, October 17, on "Some Interesting Fundus Pictures"; the section on otology and laryngology was addressed, October 18, by Dr. Herbert Tilley, London.——The Medical Club of Philadelphia gave a reception, October 18, in honor of Dr. Ernst Fuchs, professor emeritus of ophthalmology, University of Vienna, Austria.——About 700 persons attended the dinner at the Woman's Medical College, September 23, in honor of Dr. Oskar Frankl of the department of gynecology at the University of Vienna.——The late Dr. Seth M. Smith bequeathed a library containing many rare books and a collection of surgical instruments to Jefferson Medical College. ——Dr. Margaret C. J. Sturgis addressed the Obstetrical Society of Philadelphia, October 3, on "End-Results in Ten Cases of Hydatidiform Mole Treated by Curettage," and Dr. John M. Laferty on "A Test of Labor." Dr. Walter F. Harriman demonstrated a bipolar electrode for electrocoagulation of the cervical canal.——The twenty-first Mary Scott Newbold lecture of the College of Physicians of Philadelphia was given, October 2, by Dr. Joseph Barcroft, professor of physiology, Cambridge University, England, on "Alterations in Volume of the Normal Spleen and Their Physiologic Significance."——At the opening meeting of the Philadelphia Pediatric Society at the Jefferson Hospital, October 8, Dr. Louis H. Clerf read a paper on "Chronic Cough in Children"; Dr. Joseph Head, "Changing Ideas About Teething and Teeth"; Dr. Bur-

gess L. Gordon, Jr., "Dietetic Problem in Obese Young Children"; Drs. James Alexander Clarke, Jr., and Edward F. Burt, "Bronchial Asthma in Children," and Dr. John F. Coppolino, "Exclusive Bismuth Therapy in Congenital Syphilis."——Members of the staff of the Cornell Clinic, New York, will give a symposium before the Philadelphia County Medical Society, October 23, on chronic arthritis.

UTAH

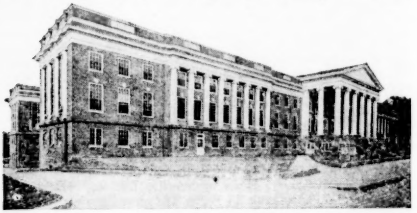
State Medical Election.—At the annual meeting of the Utah State Medical Association, Salt Lake City, July 1-3, Dr. Howard P. Kirtley was made president, Dr. William L. Rich, president elect, and Dr. Maurice M. Critchlow, secretary. The next annual session will be at Salt Lake City, Sept. 9-11, 1930.

Doctors' Hobbies and a Graduate Course.—Dr. Howard A. Kelly, professor emeritus of gynecology, Johns Hopkins University School of Medicine, Baltimore, addressed the Salt Lake County Medical Association, Salt Lake City, September 23, on "Doctors' Hobbies." The state medical society arranged a graduate course at the Salt Lake General Hospital, September 23-26, at which Drs. Donald P. Abbott, Chicago, and Howard R. Hartman, Rochester, Minn., were the principal speakers.

VIRGINIA

Personal.—Dr. Richard W. Garnett, for about ten years health officer of Danville, announces that he will not be a candidate for reappointment this month.——Dr. Harry Walker resigned as health officer of Fairfax County to accept a position on the staff of a Richmond hospital and Dr. Robert E. Feagans, Lynchburg, has been appointed his successor.

University of Virginia Dedicates Medical Buildings.—A group of medical buildings recently completed at the University of Virginia at a cost of $1,400,000 will be dedicated, October 22, at the time of the annual meeting of the Virginia State Medical Society. The principal building of the new



group illustrated here is for the medical sciences. It is connected with a 275 bed hospital by corridors. In the south wing will be the departments of biochemistry, pharmacology and materia medica, physiology, histology, embryology and photography. In the north wing will be the outpatient department on the first floor; the museum and library on the second; pathology and bacteriology on the third, and the neuro-anatomy laboratory on the fourth. The west wing is a connected pavilion with an amphitheater two stories high. The first floor of the west wing has the record room, drug room, lecture rooms, and examining and sterilizing rooms. The department of clinical pathology and a cardiac laboratory are on the second floor; laboratories for gross anatomy and surgical pathology are on the third, and on the top floor is the department of public health and hygiene. The construction of this building in such close proximity to the hospital necessitated extensive changes in the hospital and the moving of another large building. The architecture harmonizes with the Jeffersonian style of the original group of the university. Friends and alumni gave $350,000, the state of Virginia, $250,000, and the General Education Board, $800,000 toward the cost of the new buildings. At the dedication, the address of acceptance will be given by Governor Byrd; Duke University School of Medicine, Durham, N. C., will give greetings through its dean, Dr. Wilburt C. Davison; Dean James C. Flippin of the University of Virginia Department of Medicine, and Dr. Ray Lyman Wilbur, secretary of the department of the interior will speak. In the afternoon, Drs. William H. Wilmer, Baltimore, John Shelton Horsley, Richmond, and David R. Lyman, New Haven, Conn., will speak, followed by an inspection of the buildings. A joint session with the Medical Society of Virginia will be addressed by the president, Dr. J. Bolling Jones, and Drs. Hugh S. Cumming, surgeon general, U. S. Public Health Service, and Charles R. Stockard of Cornell University Medical College.

WISCONSIN

State Medical Election.—At the annual meeting of the Wisconsin State Medical Society, Madison, September 12, Dr. Frederick J. Gaenslen, Milwaukee, was made president; Dr. Archie J. McDowell, Soldiers Grove, president-elect; Dr. Stanley J. Seeger, Milwaukee, speaker of the house of delegates, and Drs. Joseph F. Smith, Wausau, and Maurice D. Bird, Marinette, delegate and alternate, respectively, to the American Medical Association. The next annual meeting will be in Milwaukee in September, 1930.

Investigator Employed to Chase Quacks.—The legislature has appropriated $5,000 for two years for the state board of medical examiners to employ a special investigator, the Milwaukee *Journal* says, "to run all fakes and quacks in the profession out of the state or into jail." The board was expected to select an investigator at a meeting, September 11. The diploma mill ring which has been operating in Illinois seems to have invaded Wisconsin also. A forged diploma has been found by the state's attorney at Chicago with the forged signatures of a former president of the State Board of Medical Examiners of Wisconsin and of the secretary. The Wisconsin board has no record of the man in whose name the forged license was issued.

Personal.—Dr. and Mrs. George H. Young, Elkhorn, celebrated their golden wedding anniversary, September 16, in the same home, it is reported, in which Dr. Young's father in 1888 celebrated his golden wedding anniversary, and each occasion also was the celebration of their fiftieth year as a country practitioner of medicine.——A testimonial dinner was given, August 23, in honor of Dr. Olaf M. Sattre, chief of staff at the Lakeside Methodist Hospital, Rice Lake, for the outstanding service he has rendered to that institution. Preceding the dinner a bronze tablet was unveiled in the vestibule of the hospital.——The governor has appointed Dr. William F. Lorenz, Madison, a delegate to the First International Congress of Mental Hygiene, to be held in Washington, D. C., May 5-10, 1930.——Dr. Julius F. Mauermann, Monroe, has been appointed to succeed the late Dr. William B. Monroe as health commissioner of that city.

GENERAL

Dr. Little Appointed Director of Cancer Society.—Clarence C. Little, LL.D., formerly president of the University of Michigan, has been appointed managing director of the American Society for the Control of Cancer, at 25 West Forty-Third Street, New York. Dr. Little will devote part of his time to this work. He is also director of the Roscoe B. Jackson Memorial Laboratory, Mount Desert Island, near Bar Harbor, Maine, where he will continue experimental research on cancer, a problem on which he has been engaged for years.

Assisting American Graduate Students in England.—The Fellowship of Medicine and Post-Graduate Medical Association, 1 Wimpole Street, London, W. 1., England, is a central bureau of information, which will assist American physicians in arranging courses for graduate study in hospitals and clinics in London. No charge is made for this service. Opportunities for clinical work in London are provided the year round in forty hospitals associated with the fellowship. There are also special courses on practically all medical subjects, and free demonstrations weekly. The Fellowship of Medicine on inquiry to the secretary will supply the dates, duration and opportunities for these courses as well as the dates of the various examinations for degrees and diplomas.

Science Aids the Button Industry.—The mussel glochidia, which normally is parasitic on the gills of certain fishes, may be propagated now by a new method worked out after a long series of experiments by Max M. Ellis, Ph.D., professor of physiology, University of Missouri, and Mrs. Ellis. A public demonstration of the new method for fresh water mussel propagation was given at the U. S. Bureau of Fisheries Biologic Station, Fairport, Iowa, August 26. The American Button Manufacturers' Association was invited. The application of the discovery to problems of the button industry was explained. Since the new method eliminates the normal parasitism of these mussels, the planting of valuable mussel species may be controlled and streams restocked on the same basis that streams are now restocked with fish fry.

Society News.—Dr. Harry M. Archer, New York, was elected president of the National Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions at the eighth annual meeting in Detroit, September 28, and Dr. Arthur Wildman, New York, secretary. The next annual meeting will be in New York.——Dr. Paul P. McCain, Sanatorium, N. C., was elected president of the Southern Tuber-

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culosis Conference at the meeting in Nashville. The next annual meeting will be held in Atlanta.——The first National Birth Control Conference will be held at the Hotel Astor, New York, November 18-20.——The seventh Latin-American Medical Congress will meet in Mexico City, Jan. 12, 1930.——Members of the American Nurses' Association have completed raising the fund for the American Nurses' Memorial Building at Bordeaux, France, dedicated to the Florence Nightingale School of Nursing in memory of the 296 American nurses who died in service during the World War. The memorial building is said to be an imposing part of the group of buildings of Bordeaux Hospital.

Seven Physicians in Seventy-First Congress.—There will be seven physicians in the seventy-first Congress which convenes in December. There were eight in the last Congress and in the sixty-ninth Congress, only six. According to the New York *Times*, the newest physician congressman is Senator Henry D. Hatfield, West Virginia; the oldest in the point of service is Representative John W. Summers of Washington. Senator Hatfield graduated from the University of Louisville (Ky.) School of Medicine in 1893 and University and Bellevue Hospital Medical College in 1904. He was health commissioner of Mingo County, West Virginia, for five years, was formerly a railway surgeon, a member of the state legislature and governor of West Virginia. Dr. Royal S. Copeland, New York, who will be serving his second term in the Senate, is a graduate of the University of Michigan where he was a teacher, and mayor of the city of Ann Arbor. He went to New York in 1908 and later became commissioner of health of the city. Other physicians in Congress will be Drs. William I. Sirovich from New York, a graduate of Columbia University and for years in active practice until elected to Congress in 1926; Dr. J. Howard Swick of Pennsylvania, a graduate of Hahnemann Medical College, and a practitioner until elected to the seventieth congress; Dr. Edward M. Irwin of Illinois, who has been in the last three congresses, and Dr. Frank P. Bohn of Michigan, who will be serving in his second congress.

Medical Bills in Congress.—S. 1721, introduced by Senator Goldsborough, Maryland, proposes that acting assistant surgeons of the navy who, on the date of the passage of the bill, have reached the age of 64 years, shall be placed on the retired list of the navy with pay at the rate of three fourths of their active duty pay. S. 1775, introduced by Senator Brookhart, Iowa, proposes to amend the World War Veterans' Act to provide compensation and medical treatment for all veterans for death or disability resulting from any cause, whether of service origin or not. The bill proposes, also, to eliminate the time limit within which, under existing law, claims for compensation or medical treatment must be filed. The purpose of the World War Veterans' Act as now stated in the act is "to provide a system for the relief of persons who were disabled, and for the dependents of those who died as a result of disability *suffered in the military service of the United States between April 6, 1917, and July 2, 1921.*" The bill proposes to restate this purpose as follows: "To provide a system for the relief of persons who were in the military service of the United States between April 6, 1917, and July 2, 1921, who are or shall be disabled, and for their dependents upon their death." S. 1812, introduced by Senator Copeland, New York, proposes to authorize the director of the census to compile and publish annually statistics relating to inmates of institutions for the mentally diseased, defective, dependent and delinquent classes.

FOREIGN

Experts Consult on Vaccination Methods.—The Health Committee of the League of Nations called a conference of experts which met in Paris, July 4-6, to inquire into the methods of vaccination against diphtheria and scarlet fever. These have not been widely introduced as yet into Europe, although they have generally produced encouraging results in the United States. The chairman of the conference was Prof. T. Madsen, Copenhagen; other members were Drs. Bie, Copenhagen; Borcic, Zagrab; E. H. R. Harries, Birmingham; Hirszfeld, Warsaw; O'Brien, Kent, England; Ramon, Seine-et-Oise; Schubert, Prague; Tomesik, Budapest, and Professors Cantacuzene, Bucharest; R. Debré, Paris; Friedemann, Berlin, and Gorter, Leyden. They drew up a plan for a set of experiments covering about 20,000 cases in European countries to be conducted so that comparisons can be made with the different methods of vaccination and with the different materials used. Identical methods and identical material, if possible, are to be used in all the countries so that comparative conclusions for practical application can be drawn from the results of the experiments. The Schick test is to be comparatively carried out with anatoxin, toxoid and toxin-antitoxin. Comparative experiments are to be carried out in patients with scarlet fever with regard to the Dick reaction and the degree of positive immunity conferred. Records will be kept on standard forms. The Danish Government Serum Institute will provide each of the countries in which the work is being done with two Dick strains and one Dochez strain. From these strains anatoxin is to be prepared according to a uniform procedure laid down by Ramon, and the anatoxin so prepared will be compared with anatoxin prepared from local streptococcic strains. By this means it is expected that the results will form a reliable basis for a more extensive study of problems which it has not been possible yet to solve owing to their complicated character.

Government Services

Army Personals

Col. James F. Hall has been assigned to the seventy-eighth division at Newark, N. J., for duty with the reserves of the second corps area on completion of his tour of foreign service. ——Capts. Charles R. Bullock and John A. Matson, having been found physically disqualified for promotion, have been retired from active service as majors.——Capt. James R. Bibighaus has been assigned to Fort Winfield Scott, California, for duty.——Capt. Samuel W. Pennington, medical administrative corps, on his own application is retired from active service, effective December 24, after more than thirty years' service. ——Lieut. Col. Paul L. Freeman will sail from New York about Jan. 17, 1930, for the Philippine Islands for duty.—— Col. Ernest L. Ruffner has been ordered from Fort Sam Houston, Texas, to Fort Riley, Kansas, for duty.——Col. Will L. Pyles has been relieved from duty at Atlanta and assigned to the seventy-seventh division with the organized reserves with station at New York.——Lieut. Col. Lucius L. Hopwood, on completion of his present tour of foreign service in the Panama Canal Department, will proceed to the New York General Depot, Brooklyn, for duty.——Major Omer A. Newhouse will sail from San Francisco about Feb. 8, 1930, for the Philippine Islands for duty.——Major William C. Pollock has been ordered from the general dispensary, New York, to Fitzsimons General Hospital, Denver, for duty, from which station Capt. Charles E. Sima has been relieved and assigned to Fort Riley, Kansas. ——Major Guy L. Qualls has been assigned to Fort Leavenworth, Kansas, for duty, and Lieut. Col. Thomas J. Leary to Fort Benning, Georgia. Major Jaime J. Figueras sailed about October 15 for Corinto, Nicaragua, for station and duty with the chief of engineers of the investigations and survey in Nicaragua.——Major Charles E. MacDonald shipped as surgeon on the Lamport and Holt liner *Voltaire* during his two months' leave of absence this summer. He visited medical centers in Argentina and Brazil. Major MacDonald commends this method of utilizing leaves of absence to other army officers. ——Lieut. Col. Charles E. Freeman relieved from duty at Fort Bliss, Texas, to sail from San Francisco about January 29 for the Panama Canal Department.——Capt. William H. Houston transferred from army transport service, Fort Mason, California, to Fort Meade, South Dakota, and Capt. Arthur W. Drew from duty at disciplinary barracks, Fort Leavenworth, to Fort Rosecrans, California.——On completion of his tour in the Philippines, Major Norman T. Kirk will be assigned to Walter Reed General Hospital, Washington, D. C., for duty, and Major William J. Burdell on completion of his tour in Hawaii to Fort Bliss, Texas.——Major Percy E. Duggins on completion of his tour in the Panama Canal Zone will be assigned to Letterman General Hospital, San Francisco.——Major Henry S. Beckford will sail from New York about February 21 for duty in the Hawaiian Department, and Major John J. McCormick, about February 28, for the Panama Canal Department.——Major Clyde W. Jump, Fort D. A. Russell, Wyoming, will sail from San Francisco about March 1, 1930, for the Panama Canal Department, and Capt. Carlton D. Goodiel about March 1 for the Panama Canal Department.——Col. Christopher C. Collins is relieved from further duty with the reserves of the second corps area with station at Newark, N. J., and ordered to army medical center, Washington, D. C.——Col. Albert E. Truby has been transferred from Governors Island, New York, to duty in the surgeon general's office, Washington, and Lieut. Col. William S. Shields from Fitzsimons General Hospital, Denver, to Fort Sam Houston, Texas.——Major Lanphear W. Webb, Jr., has been transferred from Fort Hamilton, New York, to Fort Rosecrans, California, and Capt. Milo B. Dunning from Fort Rosecrans to Fort Robinson, Nebraska.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 21, 1929.

League for Sexual Reform

The third international congress of the World League for Sexual Reform was held in London under the presidency of Dr. Magnus Hirschfeld of Berlin, director of the Institut für Sexualwissenschaft. In his presidential address on "The Development and Scope of the Science of Sexology," he mentioned that among the claims advocated last year by the Copenhagen congress of the league the first was for political, economic and sexual equality for men and women. It was not until the beginning of the present century that sexual science won for itself an independent position among the natural sciences. The four main divisions of sexology were sexual biology, sexual pathology, sexual ethnology and sexual sociology. After outlining the interrelation of these divisions, he went on to say that it was not merely the sexual history of the individual that concerned them; sexual hygiene had opened a new chapter in sexual biology. What had so far been written on it had been dictated more by other points of view than the purely scientific. He would emphasize one point: Men and women whose sexual temperament diverged from the normal should neither marry nor have children. They should be allowed to live their own lives. Sex abnormality should not be overestimated, but, on the other hand, it should not be underestimated, and there should be no conspiracy of silence against it.

Dr. Haire, secretary of the congress, said that public opinion should be educated so that the sterilization of unfit persons would be as far as possible voluntary. In persons who were a menace to society sterilization should be compulsory. Sterilization did not produce loss of emotion or copulative ability, as commonly supposed. Legislation regulating this matter had been introduced in some American states, but such legislation had certain dangers. It might be misapplied for political or economic causes, but it was no more dangerous than the segregation of lunatics or the incarceration of criminals.

Dr. J. Leunbach of Copenhagen said that sterilization was the most important means available for race improvement, but ideas on the subject were still governed by tabus. A recent bill in Denmark provided for the sterilization of certain classes of the unfit, but only in public institutions and with the special permission of the ministry of justice. That illustrated the futility of legislation in such matters. Legislation was a check on progress in all matters of race hygiene.

Dr. M. D. Eder of London said that factors of inheritance were more complex than was thought, and biology had not such definite laws to guide reformers as was previously believed. Sterilization would not get rid of the unfit. Other considerations suggested that man's advance was attained best by a minimum of interference by experts in sexual relations, marriage and procreation. Sterilization at the wish of the unfit might be desirable, but all legislation of a compulsory character must be class legislation and must be regarded with suspicion. In all such matters greater individual freedom was wanted, not greater legislative interference.

REFORM OF MARRIAGE LAWS

Dr. Bernard Hollander, a London psychiatrist, made a plea for reform to allow divorce in cases of incurable insanity. He said that marriage was the most important step that a human being could take. Yet the law placed practically no restrictions on it. Except for the idiot and the raving maniac, legally unable to make a contract, no one was so diseased, crippled or deformed that he or she might not marry and become the parent of a suffering, helpless family. Once a couple is tied, tied they must stay. Any one having made the mistake of marrying an insane person is compelled to lead a miserable life for the rest of his or her existence. In an ideal community, the first precautions to prevent individual misery and the transmission of disease would be to prohibit the marriages of unsuitable persons. If medical certificates concerning the bodily and mental health of candidates for marriage were enforced, we might stop the marriage of at least the worst types. But since such control is still regarded as an infringement of the rights of the individual, the next best step is to try to obtain facilities for the legal dissolution of marriage when one of the partners is suffering from incurable insanity. Insanity is so dreaded that people in whose family it occurs do everything to hide the fact. Hence previous mental derangement in those about to marry is seldom disclosed by the parents, or the breakdown is described as merely "nerves." The law should be amended to allow divorce for incurable insanity. It would be best if people who had had an attack of insanity before marriage or who were suffering from weak-mindedness should not be allowed to marry at all. Antecedent epilepsy or antecedent recurrent insanity, if concealed at the time of the contract, should render a marriage void.

SEX EDUCATION

Mr. Bertrand Russell said that it would be impossible to publish a treatise urging reform of the law on sexual subjects without offending the law relating to obscenity. A book on birth control for workmen's wives was condemned as indecent because it was understood by them. But highly technical terms not understood by the people might be used, while generally understood terms were considered indecent and held to be obscene.

RESOLUTIONS

The congress passed a resolution that obscenity and impropriety are matters too subjective and indefinite to serve as a basis for laws. People should be so educated as to be able to meet all kinds of knowledge and decide for themselves what they avoid or reject as obscene. In literature and art judgment differs widely and any form of censorship leads to condemnation of works of artistic or scientific importance. All censorship was therefore opposed. Another resolution declared that no campaign for sexual emancipation is possible without sexual education of children. Such education should not only enlighten the young as to scientific facts but awaken a sense of personal responsibility in regard to sexual life and social relations.

Optical Congress

An optical congress and trade exhibition to commemorate the three hundredth anniversary of the granting of the royal charter by Charles I to the spectacle makers of the city of London was opened by Sir Osborn Holmden, master of the Worshipful Company of Spectacle Makers and president of the congress. Mr. Charles Hyatt-Woolf, chairman of the executive committee, who presided over the opening ceremony, said that the congress was not confined to opticians, as it was of national and even world-wide interest. It brought before the public the qualifications of opticians to supplement the national health services. Speaking of the work done by opticians, he said that few people were aware that in the course of a year they dealt with the eyesight defects of 4,000,000 people. The examination scheme of the spectacle makers' company and the British Optical Association made that work possible. Vast progress had been made in every department of the optical craft. In the nineties, when the last congress was held, optical frames were of the kind that Americans called "hand-me-downs," and cynics had said that the people of the Edwardian era thought more of their appearance than they did of their eyesight. Sir Osborn Holmden said that by the royal charter the company was given

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power to make orders concerning the trade and art or mystery of spectacle making and for the punishment of abuses, deceit and other wrongful practices in uttering bad or hurtful wares within the city of London. The charter also gave the company jurisdiction over all persons "using or exercising the said art, trade or mystery of spectacle making within the realm of England." For more than 200 years the company strictly carried out its duties, and on numerous occasions exercised its authority by destroying badly made spectacles wherever found. Toward the end of the nineteenth century the company decided to institute an examination by which craftsmen could prove their qualification. The first examination was held in 1898. With the aid of the British Optical Association, a body of nearly 5,000 opticians had now been created, about half of whom held the company's diploma. The public was assured that an optician certified by these bodies was a man who understood the fundamental principles of optics and was qualified to examine the living eye for optical defects. It had been the object of the spectacle makers' company and other optical bodies, such as the British Optical Association, to raise as far as possible the code of ethical practice prevailing among opticians, and to insure, so far as possible, that all persons affected by disease and needing medical or ophthalmic treatment should be referred to ophthalmic surgeons. Both examining bodies now paid special attention to the necessity for opticians to be so trained that they might learn to detect signs of disease in its earliest stages, and this had proved a valuable supplement to the health services of the nation. The items exhibited covered a large range of optical instruments, accessories, and technical books, and there had been collected together a number of relics of past optical work in the form of old spectacles, books and prints, and many old instruments which the early pioneers evolved for the examination of the eyes.

Changes in Infectious Diseases

An important study by Dr. E. W. Goodall, Prof. Major Greenwood and Mr. W. T. Russell, entitled "Scarlet Fever, Diphtheria, and Enteric Fever, 1895-1914," has been published by the medical research council. It is based on the clinical histories of all the patients suffering from scarlet fever, diphtheria or typhoid admitted to the Eastern Fever Hospital of the Metropolitan Asylums Board during the years 1895-1914. The statistics comprise 21,290 cases of scarlet fever, 15,239 cases of diphtheria and 2,434 cases of typhoid, and in every case Dr. E. W. Goodall, a leading authority on the specific fevers, was responsible for all the clinical observations and their recording. For a period of twenty-four years, therefore, there are now available the detailed clinical observations of a single trained observer, and it is interesting to see what changes have occurred in the nature of the diseases during that period.

For studying this change in disease, three possible lines of approach are open. The fatality rate may be studied, the influence of complications, and the type of the disease. The last two go close together, and, indeed, all three are interrelated. Full statistics are given in the report, but for the purpose of illustration only the first two will be mentioned. For typhoid the fatality rate at the end of Dr. Goodall's twenty years showed only a 13 per cent decrease on what it was at the beginning, while the number of cases with complications did not vary to any appreciable extent. For diphtheria the fatality rate was about halved, comparing the quinquennial periods of 1895-1899 and 1910-1914, while there was a slight decrease in the number of complications. For scarlet fever, on the other hand, for patients under 5 years of age, always a most serious age for acute infectious fevers, the fatality rate during 1910-1914 was only 30 per cent of what it was during 1895-1899, and the most serious complications of the disease are definitely decreasing. The cause of this remarkable loss of virulence of scarlet fever is not evident.

PARIS

(From Our Regular Correspondent)

Sept. 9, 1929.

Myalgic Asthenia

M. Turries uses the term *asthénie myalgique à répétition* to designate a rather frequent group of symptoms, which he distinguishes frankly from the multitude of asthenias that develop without any immediately discernible cause. The dominant symptoms are muscular pains and a sensation of general fatigue. These two manifestations appear at somewhat irregular intervals. Secondary symptoms vary the clinical picture somewhat in different cases. The sense of fatigue is chiefly physical and it affects all the groups of muscles. Its onset is in the morning; those affected find it difficult to get up. During the day, the patients feel, from time to time, often after a slight effort, an urgent need of rest, either seated or in a reclining posture. The lassitude may continue only a few minutes or it may extend over several hours; then the subject may resume his employment. Turries gets the impression from this clinical picture that the patient has an insufficient reserve of nervous energy and that it therefore must be renewed frequently. During the attacks of lassitude the patient's face looks drawn and weary; he perspires easily and gives the impression of exhaustion. There is frequently a certain amount of mental asthenia, but it is more apparent than real. The patient endeavors to avoid all exertion lest he increase his lassitude; he thus becomes apathetic and indifferent. The muscular pains are due to a genuine myalgia and not to physiologic fatigue resulting from overused muscles. The pain affects the striated muscles, the smooth muscles remaining exempt. The regions affected are painful on pressure and palpation of the muscles. Movements of the joints reveal the presence of the algias. The myalgia may be localized or diffuse. In the former case it is found chiefly in the muscles of the thorax and of the supraspinous and subspinous fossae. Sometimes there is a "stitch" in the side. Movements of the shoulder joints cause pain. In the second case—that is, when the myalgia is diffuse—one observes a generalized fatigue of the muscles. All muscular activity is then difficult and even painful. This condition may give rise to the suspicion that a general infection exists, especially owing to the fact that such patients show a slight elevation of temperature on slight exertion. The patient presents a peculiar habitus. To avoid contracting his muscles, he bends forward. The back is rounded, the chest is hollow, the head is thrown forward and the arms are dangling, which gives the impression of extreme physical fatigue. The two manifestations, asthenia and myalgia, come and go, with many recrudescences and successive ameliorations. The frequency and duration of the attacks vary greatly. The seasons appear to exert an influence. In several of Turries' patients the spring exerted an exacerbative influence. Turries adds that the symptoms are more or less constant in patients with a particular physical constitution—namely, persons who are narrow chested, with slender limbs, thin neck, and thin and slender joints; that is to say, in "lanky" subjects. They are usually delicate and sensitive but intelligent. Some of them have a touch of cyclothymia, passing rapidly from a state of joy to one of sadness, and vice versa. These manifestations of joy or sadness are not due to external circumstances, apparently, but to the cenesthesic perception of favorable or unfavorable sensations. In all cases the mental equilibrium is unimpaired, the judgment is good, the will is intact, and the psychic individuality is normal. But what one often does observe is a digestive instability, a neurovegetative disequilibrium, an alternation of periods of gastro-intestinal dyspepsia of the hypesthenic type, with periods of normal digestion. Arterial hypotension is frequent and M. Turries believes that there is a certain parallelism between the attacks of myalgic asthenia and the tendency to

hypotension. This symptom complex, which is so clearly characterized, traces its origin to three causes: (1) syphilis, (2) tuberculosis and (3) arthritis. The syphilitic infection is commonly congenital in this disorder; rarely, it is acquired. The symptoms of congenital syphilis are not absolutely frank. Nevertheless, one observes changes in the teeth, and, in particular, Hutchinson's teeth; severe, periodic headaches, and a state of sympathetic hyperexcitability, which is wrongly designated as a "neuropathic state." Often the spleen is perceptible on percussion. But there are no characteristic nervous signs nor visceral changes. The Wassermann test and other serodiagnostic tests are negative, except in cases of acquired syphilis. A study of the patient's ancestors (often difficult to effect) would be of great aid through finding traces of infection in them. Often excellent results are secured with arsenical or bismuth treatment. A tuberculous infection is a frequent cause, but it is often dormant. A study of the antecedent line is here important. One observes, in the family of the subject affected, numerous persons with congenital weakness. Sometimes thoracic glandular reactions, and the like, are seen. Finally, myalgic asthenia is, according to Turries, often in relation with what is usually designated under the name of "heredo-arthritic terrain." Lesage had recorded previously that, in children affected with weak joints, periodic attacks of asthenia are observed. Turries states that in a given case it is often difficult to discover the initial cause, which is, however, of great importance in the cases in which antisyphilitic treatment is indicated.

Nature of Flocculation in Mixtures of Toxin and Blood Serum

M. G. Ramon, who has made some remarkable researches on diphtheria, has prepared some specimens of diphtheria toxin possessing a high value (up to from twenty to thirty antigenic units). He discovered that flocculation in mixtures of a filtrate of a diphtheria culture and an antidiphtheritic serum is the result of the mutual reaction between the toxin element and the antitoxin element, a fact that corroborates the results that he had previously secured. The frank nature of this flocculation is due to the simple constitution, from the specific point of view, of the filtrate and the serum and to the respective properties of each of the elements present, the toxin and the antitoxin. This explains the great precision and the value of the flocculation reaction in determining the value of the toxin and the dosage of antitoxin in the antidiphtheritic serum. On the contrary, the flocculation that appears in mixtures of toxin other than diphtheria toxin with corresponding antiserums is often complex. This complexity is due to the presence in the toxins of several substances that may play the rôle of antigens in vivo and in vitro. The serums prepared with these toxins contain, therefore, more antibodies. When one mixes a toxin and a corresponding serum, one provokes more or less numerous reactions, each antigen being able to react with its antibody. This explains the lack of clearness and of precision in the flocculation, in contrast with the precision of the flocculation in mixtures of diphtheria toxin and antidiphtheritic serum. It is possible, however, by taking certain precautions, to utilize the flocculation for the determination of the value of the tetanic toxin and anatoxin, for instance.

The Antirachitic Potency of Certain Algae

MM. E. Lesné and Robert Clément have discovered that the powder of certain sea algae, such as *Laminaria flexicaulis*, possesses a spontaneous antirachitic action on experimental rickets induced in the white rat. The algae of the Confervae family, found in warm sulphur springs, possess the same property, although to a less degree. The fact is particularly interesting; for the Confervae had been collected in dark spots, protected from the light. This fact indicates that the production of the antirachitic factor does not belong exclusively to light radiations, or, more particularly, to solar radiations. Hitherto, it has been thought to be ultraviolet radiations—natural or artificial—that prevented rachitism, and gave antirachitic properties to certain alimentary or medicinal substances. The results secured by Lesné and Clément do not in any way invalidate that conception but prove that the elaboration of vitamin D, which is effected in the majority of cases under the influence of the light, may, under different circumstances, be produced by another process.

Improvements in Paris Hospitals

Breakdowns in the electric lighting service sometimes cause serious inconvenience in hospitals, particularly if they occur during the course of a surgical operation. Therefore, the prefect of police has decided to install a subsidiary autonomic lighting system throughout the prefecture, to provide against such a contingency. The Assistance publique has secured from the municipal council an appropriation that will permit the installation of an emergency lighting system in the operating rooms, the wards of the surgical service, the maternity service, and the rooms reserved for consultations. Sixty-one rooms in the *hôpitaux de Paris* will be equipped with the system.

M. Fernand Moriette, member of the city council of Paris, noted, on visiting the hospitals, that, in some of the wards, the patients had to sit up in bed, being unable, because of their condition, to assume a recumbent position. Moriette proposed the use of a special adjustable rack as a back support, so that the patients might rest in a more comfortable position.

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Congress of Neurologists and Medical Alienists of French-Speaking Countries

The thirty-fourth session of the congress of neurologists and medical alienists of France and French-speaking countries will be held at Lille, July 21-26, 1930. The officers are: Professor Abadie, Bordeaux, president; Dr. Pactet, honorary chief physician of the Asiles de la Seine, vice president; Dr. Pierre Combemale, agrégé professor of the Faculté de médecine of Lille and physician to the psychopathic hospitals, general secretary. The topics chosen by the general assembly of the congress to be discussed at the thirty-fourth session are: the cerebrospinal fluid in mental disease, with Dr. Lamache, former chief of the psychiatric clinic at the Faculté de médecine de Paris, the official speaker; the elementary posture reflexes, with Dr. Delmas-Marsalet, head of the medical clinic at the Faculté de médecine de Bordeaux, the official speaker; the law pertaining to social insurance in its application to patients with mental disease, with Dr. Calmettes, chief physician of the Asile de Limoges, the official speaker.

First-Aid Stations in the Mountains

Mention has already been made of the strenuous efforts of the Touring Club de France to establish first-aid stations along the highways of France. A similar movement is now on foot to establish first-aid stations in the mountains. The first center has been created at Grenoble (Isère). The movement is supported by the Syndicat d'initiative and by other local societies interested in Alpine climbing. The center is in constant touch with the police station. The telephone connections are excellent, and messages may be transmitted on Sundays as well as on week days. The means of transportation play an essential part. Chamonix, which commands the chain of Mont-Blanc, has a particularly advantageous position. At Mer de Glace there is a mountain railway which, at the first summons of the guides, sends up a special train, with a rescue party, to bring down the killed and injured.

A railway in the region of Aiguille du Midi performs a similar service. The injured must receive quick aid, and the shelters in which there are first-aid kits and apparatus for transporting the injured play an important rôle in the case of fracture or wounds

to be disinfected. For the latter there are sealed packages of dressings, in order to prevent infection. Professor Rouvillois has invented a stretcher consisting of a frame or rack that allows the injured person to be completely immobilized. Dr. Bidon has recommended a stretcher that leaves the carrier's hands free, but it has the disadvantage of shaking the patient about more. An endeavor is being made to combine the advantages of the two types of stretcher. M. Dalloz contends that the stretcher must meet the following requirements: it must allow the carrying of the patient over smooth ground and must permit the lowering of a patient down a steep and rugged mountain side. It is planned to organize experienced rescue crews, who can reach the scene of the accident with great rapidity. The Alpine Club and the national bureau of tourists will find here an opportunity to show their capacity for action.

A Commemorative Plaque in Honor of the Physicist Marié-Davy

A commemorative plaque placed on the natal home of Edme-Hippolyte Marié-Davy, physicist-meteorologist and former director of the Montsouris Observatory, was recently dedicated at Clamecy. That eminent scientist did not confine his activities to purely scientific studies and researches but devoted himself as well to the introduction of sanitary measures that would promote the hygiene of Paris and its environs. The minister of the marine, the minister of agriculture, the prefect of the department of the Seine, and the director of the national meteorological bureau, sent representatives to the ceremonies.

BERLIN

(From Our Regular Correspondent)

Sept. 14, 1929.

The Danger from Exhaust Gases to Occupants of Automobiles

The *Zeitschrift für Hygiene* carries an article by Engineer Pilaar on the results of his studies on the dangers from exhaust gases of automobiles, and, particularly, autobuses, to the occupants of such vehicles. Pilaar reaches the conclusion that the exhaust gases of autobuses may be the cause of chronic and, under certain conditions, of even acute poisoning. Many other dangerous factors enter into the problem, such as the close atmosphere found, especially in winter, in a crowded autobus with poor ventilation. Another harmful factor is the shaking of the omnibuses, particularly on the rear seats, where often the carbon monoxide content of the air is greatest. These dangers are present not only in the old small type of Ford autobus but also in the most modern autobuses of the largest companies. In the main, too, the public appears to be ignorant of the poisonous nature of the exhaust gases. The protection of the public is a matter of general interest. In autobuses, therefore, the following improvements are greatly needed: (1) a better ventilation and (2) the introduction of the vertical exhaust system. The latter measure will improve, at the same time, the hygienic condition of the streets.

Dietetic Treatment of Tuberculosis

In keeping with the tone of the closing remarks on the Gerson-Hermannsdorfer dietetic treatment of tuberculosis, as contained in a previous letter (THE JOURNAL, September 14, p. 862), Professor Sauerbruch has published in the *Deutsche medizinische Wochenschrift* a protest against the sensational exaggerations appearing in the daily press, especially so far as they concern the results of dietetic treatment in pulmonary tuberculosis. In his explanation he makes these statements:

"The results in pulmonary tuberculosis were discussed with much greater reserve. I emphasized that frequently in that disease, which is of such widely different origin and which varies so greatly in its course, surprises of both a favorable and an unfavorable nature occur and that therefore a critical judgment is difficult. It is true that, even in this type of tuberculosis, we saw such remarkable ameliorations that we were compelled to ascribe great influence to the dietetic treatment. Public reporting of all addresses given before the Berliner Medizinische Gesellschaft has been in vogue for many years. It is justified in the case of important contributions, provided it is confined to a statement of facts. The first reports in the press were of that nature. Gradually, however, facts became so distorted as to take on a sensational aspect. The flood became an avalanche, and some distortion of facts crept in. I join other members of the profession in regretting the unhappy incident, which is sure to injure the cause and the reputation of physicians as a class. But it is still more regrettable that many patients who are gravely ill, unwisely accepting as true the exaggerations appearing in the press, reached the conclusion that the treatment of tuberculosis had been definitely solved. It is to be feared that the disappointments that are almost sure to arise as the result of the ill considered presentations that have appeared will lead to a rejection of what is to be regarded as a hopeful and promising method. The remarkable effects of a suitable diet in tuberculosis cannot, in view of the observations already made, be open to question. Verifying experiments must be conducted in a systematic and comprehensive manner before a final judgment can be reached."

Dangers from Hair Dyes

Among women, dyeing of the hair became more common with the introduction of bobbed hair. Certain styles of haircut require a certain color of the hair if they are to be effective, and, in addition, blond hair, though not common, is much affected, for "gentlemen prefer blonds," it is said. But—as Medizinalrat Schrader, in an article contributed to the *Deutsche medizinische Wochenschrift*, has pointed out—the present methods of dyeing the hair cause, not infrequently, serious injury to health. All dyes designed to produce blond hair contain hydrogen peroxide, and endeavors to substitute some other dye have been in vain. Since a single application of the dye is usually not sufficient and a repetition is not good for the hair, the hair is usually not washed after the treatment but is dried immediately, at the same sitting. If the Fön apparatus commonly used to dry the hair gets out of order, so that a spark is thrown off by the mechanism, hair that has not been washed after the application of hydrogen peroxide (which decomposes rapidly) may catch fire and cause severe and dangerous scalp burns, which leave unsightly scars that persist throughout the patient's life. The danger from burns is still greater if, to increase the staining action of the dye, ether or benzine is added to the hydrogen peroxide. In that case, the unwashed hair may catch fire not only from the Fön apparatus, as just described, but also from the use of a wooden drying cap in which a warm current of air is produced by the installation of small electric lamps. The master barbers know the dangers of a careless use of hair dyes, and warn against drying the hair without first washing it after an application of hydrogen peroxide. Nevertheless, it is often done, because the barbers feel secure. Such accidents as described are of comparatively rare occurrence, and as most barbers obtain, for a low premium, liability insurance that permits the payment of big damages, the injured woman usually is willing to settle and does not prosecute the barber for his carelessness.

If a red or reddish brown color of the hair is desired, dyes are used to which copper compounds are added. These may produce skin eruptions or ulcers, which leave unsightly scars. Especially unfortunate, from a cosmetic point of view, are scars near the eyes when the eyebrows or eyelashes are dyed reddish brown. In dyeing the hair of the head, the hair line especially is endangered. The dangers from hair dyeing are increased by the fact that the women (who are now usually the operators) are not ordinarily as well trained as the men.

Results of Diet in Patients with Lupus

In the Licht- und Lupusheilstätte in Giessen, Privatdozents S. Bommer and L. Bernhardt have been making extensive trials of the dietetic treatment proposed by the Bielefeld physician Gerson and endorsed by Professor Sauerbruch. In the current number of the *Deutsche medizinische Wochenschrift*, they give a detailed report concerning the remarkable results that they secured. They began the dietetic treatment in January, 1928, with ten patients with lupus, excluding, from that time on, every other form of therapy. The number of patients on the diet has been increased from month to month, so that now more than 150 lupus patients are taking the treatment. Since December, 1928, the good results of the dietetic treatment have led to its general adoption throughout the institution. Within a few days after the beginning of the treatment, a retrogression of the swelling and a change in the color in the vicinity of the lupus nodules were often noticed. After the swelling and the bluish-red discoloration have disappeared, a narrow bright red margin remains, which gradually fades away during the following weeks. The various lupus infiltrations in the now entirely blanched skin become at first more distinct but then seem to melt away; they spread out in all directions, the margin becoming less well defined, until they are gradually absorbed by the surrounding tissues and disappear. There remains only a bright red network, made up of minute whitish scars, until gradually the redness disappears and a delicate pale scar remains, which is with difficulty distinguished from the surrounding skin. Two illustrations (in the original article) of a patient before and after treatment show this very plainly. The mode of retrogression of the disease is always the same, though the time within which a cure is effected varies considerably. The duration of the treatment can be shortened by the combined use of previously recognized modes of treatment. General light treatment and, particularly, sun baths (of the whole body) exert a favorable influence. The conclusion reached by both physicians is that a general method of treating lupus vulgaris has been developed that makes it possible to effect a complete cure of grave, extensive and resistant cases. The cure is accomplished with most excellent cosmetic results, and it is attained solely by changes in the diet and the mode of living.

NETHERLANDS

(From Our Regular Correspondent)

Sept. 24, 1929.

Pasteurization of Milk by Electricity

A Netherlands milk-producing organization has introduced a new apparatus for pasteurization, invented by Aten and Lulofs. The milk is subjected to a current of 3,000 volts between two electrodes. The apparatus is equipped with a regulator that maintains automatically the needed temperature.

Congress on the Hygiene of Childhood

A special congress was held recently in Amsterdam for the study of means of preserving the health of children between the ages of 1 and 6. The opening session was presided over by the minister of public health. The question of the means to be employed to prevent and combat the diseases that are the most disastrous (measles and whooping cough) was discussed in detail. Considerable time was devoted also to the prophylaxis of the chronic diseases and disorders that levy such a heavy tribute on young children: tuberculosis, rickets, deformities, and diseases of the teeth. Time was given likewise to a consideration of the question of the schools suitable for that class of children; the question of food, the problem of placement in a rural community, and the proper type of desks for school children. Finally, a committee was appointed to study the ways and means of creating a practical organization for the protection of children aged from 1 to 6.

Distribution of Hospitals in the Netherlands

In response to an inquiry received from the International Bureau of Hygiene, Dr. Josephus Jitta has prepared a complete report on the number and the activities of the hospitals in the Netherlands. A few years ago it was held that, for the large cities, five hospital beds per thousand of population was sufficient. This figure is still accepted for the rural districts, while for the large cities some who are in a position to judge of the needs demand from eight to ten beds per thousand inhabitants. Amsterdam has at present 6.9 beds per thousand inhabitants, and experience has shown that the figure might be still higher, since it is advisable not to have all the beds occupied ordinarily but to hold a certain number in reserve. The mining districts in the province of Limburg constitute a special problem. These are the districts of Maestricht and Heerlen with adjacent areas.

In general, the cities of more than 50,000 population are well provided for, but that is not the case in the rural districts. However, owing to the improved facilities for transportation, that fact does not present much difficulty.

The tuberculosis sanatoriums in the Netherlands have, at present, the following bed equipment: 836 beds for men; 998 beds for women; 286 beds for children, and 295 beds not specified, or a total of 2,415 beds. The sanatoriums for children alone have 589 beds, in addition, so that there are more than 3,000 beds available for the tuberculous, in the sanatoriums.

The institutions for mental diseases are under the control of the central government, the several provinces or private organizations, chiefly of a religious nature. There is a total of 20,000 beds for mental patients, or 2.8 per thousand of population.

Researches on Yellow Fever

Since the discovery that the *Macacus rhesus* monkey is sensitive to yellow fever, it has been possible to make laboratory studies on the disease. Dinger, Schuffner, and Snijders and Swellengrebel have been carrying on experiments in the laboratory of tropical hygiene of the Colonial Institute in Amsterdam. Whereas yellow fever is well known in the West Indies, it has never made its apprearance in the East Indies, although the mosquito that transmits the disease is found there. It is evident, therefore, that the importation, to the Orient, of a case of yellow fever might have most disastrous consequences. No experiments even can be carried on in the East Indies, for it would be a criminal risk to import the virus for experimental purposes. No danger exists, however, in the temperate regions, for the absence of the transmitting agent excludes all propagation of the disease. Experiments have shown that it must be accepted as certain that *Aedes aegypti* in the Dutch East Indies is not refractory to the virus of yellow fever and that the East Indies are therefore not protected against this disease. Under these circumstances, extreme vigilance must be exercised in order that the Dutch East Indies may continue to possess exemption.

Departure of Professors

In the Great Hall of the University of Groningen, special ceremonies were held recently in honor of Professor Koch. In his address, Professor Koch reviewed the progress of surgery in general and at Groningen in particular. A few days later, in the same setting, similar ceremonies were instituted in honor of Professor Wiersma. In his discourse, Professor Wiersma called attention to the close connection between the neurologic and the psychiatric examination in various clinical cases. He then discussed the interpretation of results of inquiries concerning the relations between body functions and the temperament—the classification of individuals into different types.

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Marriages

CHARLES E. GARRATT, Hot Springs National Park, Ark., to Miss Lucile F. Wahlig of Sea Cliff, N. Y., October 9.

HERMAN S. HOFFMAN to DR. KATHARINE GODFREY SYMMONDS, both of Washington, D. C., September 26.

FREDERICK GILBERT RITCHIE, New York, to Miss Helen Louise Godfrey of Norwalk, Conn., September 30.

WENDELL DOW GEORGE, Watertown, N. Y., to Miss Frances Laura Small of Brookline, Mass., September 16.

LINVILLE I. FARMER, Somerset, Ky., to Miss Marietta Goggin at Huntsville, Tenn., September 1.

FREDERIC KOEHLER, Bellevue, Ky., to Miss Ruth Jane Horne of Uhrichsville, Ohio, recently.

CALVIN ALBERT LAUER, Danville, Ill., to Miss Evelyn Alice Johnson of Minneapolis, August 12.

WILLIAM RICHARD MINER, Covington, Ky., to Miss Statira Childress of Erlanger, August 10.

DENNIS GROOMS EVANS, Louisville, Ky., to Miss Nina M. Jesse of New York, in August.

FRANK R. SMITH, Baltimore, to Miss Dorothy Truitt of Salisbury, Md., October 4.

SAMUEL MORTON CRESWELL, Tacoma, Wash., to Miss Alice M. Snyder, August 19.

EUGENE YOUNG, Champaign, Ill., to Miss Madge Myers of Mansfield, August 31.

MAURICE LAMM BLATT to Miss Betty Schueren, both of Chicago, October 2.

Deaths

Hugh B. Meredith, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1877; member of the Medical Society of the State of Pennsylvania, and the American Psychiatric Association; formerly superintendent of the Danville State Hospital; past president of the Montour County (Pa.) Medical Society; aged 75; died, August 1, of chronic myocarditis.

William John Robinson, London, Ont., Canada; University of Toronto Faculty of Medicine, 1883; member of the American Psychiatric Association; associate professor of psychiatry, University of Western Ontario Medical School; superintendent of the Ontario Hospital; aged 71; died suddenly, September 3, of heart disease.

David W. Walley ✠ Lumberton, Miss.; Barnes Medical College, St. Louis, 1907; member of the American College of Surgeons; formerly superintendent of the Mississippi State Charity Hospital; proprietor of the Lumberton Hospital; aged 44; died, in September.

West J. Hodge, West Monroe, La.; Memphis (Tenn.) Hospital Medical College, 1908; member of the Louisiana State Medical Society; also a druggist; aged 50; was found dead, September 24, of an overdose of chloroform taken to relieve a headache.

Frank Sumner Atwood, Salem, Mass.; Harvard University Medical School, Boston, 1882; formerly city physician and member of the school board; for many years on the staff of the Salem Hospital; aged 72; died, September 17, of acute nephritis.

Thomas Aubrey Dickson ✠ Houston, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1892; member of the American College of Surgeons; aged 58; died, July 20, at Rochester, Minn., of gastric ulcer.

Emil Simon, St. Louis; Medizinische Fakultät der Julius-Maximilians Universität, Wurzburg, Bavaria, 1890; member of the Missouri State Medical Association; formerly member of the school board; aged 61; died, August 16, of heart disease.

Thomas M. Williamson ✠ Saginaw, Mich.; Trinity Medical College, Toronto, Ont., Canada, 1892; past president of the Saginaw County Medical Society; on the staff of the Saginaw General Hospital; aged 65; died, August 30, of lobar pneumonia.

Edward B. Giese, Walla Walla, Wash.; Marquette University School of Medicine, Milwaukee, 1927; served during the World War; aged 33; died, August 31, at the U. S. Veterans' Hospital, number 85, of chronic pulmonary tuberculosis.

John Rezin Boyd, Springfield, Mo.; University of Louisville (Ky.) School of Medicine, 1886; member of the Missouri State Medical Association; aged 74; died, September 21, at the Springfield Baptist Hospital, of cerebral hemorrhage.

John R. Murnan ✠ Covington, Ky.; Medical College of Ohio, Cincinnati, 1883; member of the American College of Surgeons; on the staff of St. Elizabeth's Hospital; aged 68; died, in September, in Syracuse, N. Y., of heart disease.

John Colton Wells ✠ Rochester, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1922; on the staff of the General Hospital; aged 32; died, September 7, at Saranac Lake, of pulmonary tuberculosis.

Edward Stacey Dungan, Conway, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1900; aged 50; died, September 15, at the Allegheny General Hospital, Pittsburgh, of carcinoma of the sigmoid.

Otto Joseph Cook, Venezuela, South America; Southern Methodist University Medical Department, Dallas, Texas, 1912; served during the World War; aged 40; died suddenly, July 21, of cerebral hemorrhage.

Jacob Aftel, Toledo, Ohio; Toledo Medical College, 1901; member of the Ohio State Medical Association; aged 61; died, September 3, at the Flower Hospital, of injuries received when struck by an automobile.

Joseph S. Simsohn, Philadelphia; Jefferson Medical College of Philadelphia, 1874; member of the Medical Society of the State of Pennsylvania; aged 77; died, September 18, of carcinoma of the stomach.

Hannibal Hamlin Bryant, Jr., Gorham, N. H.; Medical School of Maine, Portland, 1910; member of the New Hampshire Medical Society; aged 45; died, September 12, of bronchopneumonia.

Dennis Cornelius O'Leary, Providence, R. I.; Harvard University Medical School, Boston, 1907; aged 54; died, in September, of chronic myocarditis, cerebral thrombosis and bronchopneumonia.

Daniel R. Peters, Mount Sterling, Ill.; Keokuk (Iowa) Medical College, 1906; aged 53; died, July 22, at the Jacksonville State Hospital (Ill.), of arteriosclerosis and bronchopneumonia.

Christopher K. Wallace, Frankfort, Ky.; Bellevue Hospital Medical College, 1870; member of the Kentucky State Medical Association; Civil War veteran; aged 80; died, August 23.

Henry McBride Kier, San Diego, Calif.; University of Michigan Medical School, Ann Arbor, 1869; St. Louis Medical College, 1874; aged 81; died, January 24, of carcinoma of the larynx.

Harry Edward Knipp ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1887; aged 61; died, August 14, at the Maryland General Hospital, following an operation.

Carl C. Hansen, Bangkok, Siam; Cooper Medical College, San Francisco, 1893; at one time medical missionary in Persia, Turkey and Siam; aged 67; died, August 2, of carcinoma of the colon.

Moses Thurston Runnels, Kansas City, Mo.; Homeopathic Hospital College, Cleveland, 1874; Kansas City Hahnemann Medical College, 1905; aged 79; died, September 7, of chronic nephritis.

Hero Kruse, Peoria, Ill.; Universität Heidelberg Medizinische Facultät (Badische Ruprecht-Karls Universität) Heidelberg, Baden, 1866; aged 87; died, September 24, of heart disease.

W. D. Poe, Dallas, Texas; University of Arkansas School of Medicine, Little Rock, 1904; member of the State Medical Association of Texas; aged 59; died, September 14, of heart disease.

Charles J. E. Lundbeck ✠ Brooklyn; Eclectic Medical College of the City of New York, 1883; on the staff of the Swedish Hospital; aged 81; died, September 19, of pulmonary edema.

William Archer Smith, Springfield Gardens, N. Y.; Medical Department of the University of the City of New York, 1882; aged 74; died, July 31, of gastric ulcer and endocarditis.

John Louis Warr, Lebanon, Ky.; Louisville National Medical College, Medical Department State University, Louisville, 1907; aged 57; died, September 18, of abdominal carcinoma.

Oliver P. M. Mills, Grant City, Mo.; Marion-Sims College of Medicine, St. Louis, 1892; aged 66; died, September 21, of cerebral hemorrhage following an automobile accident.

John Gilmore Kirker, Ferndale, Mich.; Michigan College of Medicine and Surgery, Detroit, 1889; aged 83; died, September 16, of injuries received in an automobile accident.

Gardner L. Miller, Providence, R. I.; New York Homeopathic Medical College, 1880; aged 72; died, in September, at the Rhode Island Hospital, of cerebral hemorrhage.

Alvin Kramer Fouser, Akron, Ohio; Medical College of Ohio, Cincinnati, 1876; formerly county coroner; aged 75; died, September 6, at the City Hospital, of heart disease.

Frank D. Kinsley, Compton, Calif.; College of Physicians and Surgeons, Baltimore, 1882; aged 70; died, May 15, of bronchopneumonia following a prostatectomy.

James L. E. Brantley, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1905; aged 48; died, in September, of cerebral hemorrhage.

Charles Brittain Sutliff, Johnstown, Pa.; Lincoln Memorial University Medical Department, Knoxville, 1897; aged 55; died, August 12, of lobar pneumonia.

Charles H. Seybert, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1903; aged 50; died, September 14, of gastro-enteritis.

Brownlee Robertson Ward, New Haven, Conn.; Medical Department of Columbia College, New York, 1892; aged 60; died, August 26, of heart disease.

John McNaul, Mansfield, Ohio; University of Wooster Medical Department, Cleveland, 1881; aged 81; died, September 5, of organic heart disease.

Clarence Jamie Neilson, San Francisco; Jefferson Medical College of Philadelphia, 1911; aged 47; was found dead in bed, July 25, of heart disease.

Maximilian Davidoff, New York; Medical Department of the University of the City of New York, 1894; aged 68; died, August 11, of arteriosclerosis.

Alfred C. Peterson, San Francisco; Hahnemann Medical College of Philadelphia, 1877; aged 75; died, July 18, at Oakland, of cerebral hemorrhage.

Adnah Knight Frain, Palm Springs, Calif.; Michigan Homeopathic Medical College, Lansing, 1873; aged 83; died, February 19, of heart disease.

Alse Wilson Bell, Birmingham, Ala.; Medical Department of the University of Alabama, Mobile, 1897; aged 55; was accidentally drowned, July 6.

Frank Magee Wright, Wellston, Ohio; Ohio Medical University, Columbus, 1900; aged 50; died, September 8, of traumatic, transverse myelitis.

John Charles Stamm ✠ Chicago; Rush Medical College, Chicago, 1889; aged 60; died, September 2, at St. Joseph's Hospital, of angina pectoris.

Charles Lee Lawrence, Oakland, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1894; aged 63; died, July 27, of cerebral hemorrhage.

Milton Harris Atkins, Menlo Park, Calif.; College of Physicians and Surgeons, Chicago, 1894; aged 59; died, April 13, of cerebral hemorrhage.

Patrick Joseph McKeown ✠ Saranac Lake, N. Y.; Tufts College Medical School, Boston, 1924; aged 30; died, July 17, of pulmonary tuberculosis.

Herman Roth ✠ New York; Long Island College Hospital, Brooklyn, 1904; aged 58; died, August 15, at Long Beach, of coronary thrombosis.

Frank R. Waters, Chicago; Hahnemann Medical College and Hospital, Chicago, 1888; aged 74; died, September 5, of chronic myocarditis.

George Louis Alexis Hamilton ✠ Los Angeles; Baltimore Medical College, 1900; aged 60; died, July 29, of acute gangrenous cholecystitis.

Benjamin Franklin Dixon, Salyersville, Ky. (licensed, Kentucky, 1915); aged 73; died, July 19, of acute nephritis and gastro-enteritis.

Leonard Muir, Alvo, Neb.; Lincoln Medical College of Cotner University, 1897; aged 54; died, in August, in Lincoln, of pneumonia.

George L. Meredith, Troy, N. Y.; Medical Department of Columbia College, 1888; aged 71; died, September 7, of heart disease.

John F. Gannon, Providence, R. I.; Cornell University Medical College, 1905; aged 53; died, February 26, of heart disease.

Emanuel Whitaker, Columbus, Ohio (licensed, Ohio, 1896); Civil War veteran; aged 89; died, September 22, of myocarditis.

Bureau of Investigation

MIZAR AGAIN

Joseph Sorokowski Debarred from the Mails

For a good many years one Joseph Sorokowski, who has done business variously from Chicago and a Chicago suburb, Oak Park, has been selling nostrums, especially to Poles. Sorokowski's chief nostrum, "Mizar," was sold as a remedy for rheumatism in particular, but was also recommended for sprains, chilblains, headaches, frost-bite, "ear sounds," cold in the chest, asthma—or what have you? More than five years ago, when THE JOURNAL began receiving reports of rather violent cases of dermatitis following the use of Mizar, the Bureau of Investigation submitted specimens of this nostrum to the A. M. A. Chemical Laboratory, which reported that the product was an ointment having as a base, a mixture of soap, petrolatum and a saponifiable fat, with red pepper as the active ingredient.

The directions for using Mizar were that it should be rubbed on the parts affected and then a bandage put on. In two or three days an eruption might be expected to appear, which would prove that the rheumatism was "coming out."

Mr. Sorokowski also had one or two other remedies. One of them was "Logos," which was said to be effective "for young ladies who are losing their monthly menstruation or having same too plentiful, or white flowings due to the unclean womb." It was also said to be good for "internal ailments" such as "Gripping or Colics," loss of appetite and "Overstraining of the Womb." It was also good for men who were suffering from "ache under chest," loss of appetite, or "Loss of natural Manly Strength."

In addition, Mr. Sorokowski had "an unequalled remedy for headache and hair strengthening" that was "also helpful for hair growth." This last marvel was known as "Zdrojanka"—presumably, any one trying to pronounce this would need a remedy for headache!

Now the postal authorities have got around to Joseph Sorokowski, who also has advertised under such names as "Z. Joseph Sorokowski," "Jozef Sorokowski" and "J. Sorokowski." According to the memorandum of the Solicitor of the Post Office Department, recommending the issuance of a fraud order, Sorokowski was born in that part of Austria which is now part of Poland. His qualifications for treating human ailments apparently depend on the fact that he is a carpenter by trade. The Solicitor's memorandum states that, previous to the hearing, Sorokowski refused to divulge the ingredients of his products and that both Mizar and Logos were analyzed by the federal chemists. They found, as was to be expected, that Mizar was an ointment containing capsicum. At the hearing Sorokowski volunteered the information that the ointment was a mixture of vaseline, horse bone marrow, lamb bone marrow and "a certain root of a plant" which, he said, he could not name but which he claimed to purchase from Chicago florists. Apparently, Mr. Sorokowski was unwilling to admit the presence of pepper in his mixture. He claimed that Mizar cost him $1.50 a bottle to make; it was retailed at $4.25 a bottle.

Logos, according to the Solicitor's memorandum, which was the preparation recommended for amenorrhea and "loss of manly strength," contained 82 per cent of alcohol with other volatile matter aggregating 93.5 per cent! At the hearing Sorokowski stated that it also contained "the genital glands of the beaver." Obviously, a mixture containing 82 per cent of alcohol and the genital glands of the beaver ought to do something for suffering men and women. Sorokowski admitted that the ingredients of Logos cost him $1 a bottle and it was sold by him for $3.

As in all such cases, it was necessary for the government to present medical expert testimony to show that the claims made by this quack were fraudulent and preposterous. Sorokowski, at the time of the hearing, submitted no evidence in support of his claims other than lay testimonials. Sorokowski was defended at the hearing by two Washington, D. C., attorneys, Messrs. Milton Strasburger and Theodore K. Bryant, respectively. The memorandum then states:

"At the conclusion of the hearing, attorneys for Sorokowski were given a week to file such further data as they cared to

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submit. As a result, a sworn statement has been forwarded here from S. F. Przygocki of Chicago, whose letterhead bears the affix 'M.D.,' and who states he has 'tried' the medicine 'Mizar' in several cases (ailments not indicated) where a 'counter-irritant and analgesic is used' with 'good results.' Another sworn statement is from a Dr. J. F. Korecki, also of Chicago, who states that he has used 'Mizar' in several cases of rheumatism as an 'analgesic and counter-irritant.' The question as to the value of a 'counter-irritant' has already been noted and no further reference thereto appears to be necessary."

According to the records of the American Medical Association there is in Chicago a Dr. S. F. (Stanley Francis) Przygocki who was born in 1893 and holds a diploma from Loyola University School of Medicine dated 1918. He is licensed to practice medicine in Illinois. Dr. Przygocki is a member of the Chicago Medical Society and, through that, has qualified as a Fellow of the American Medical Association. The records also show that there is in Chicago a Dr. J. F. (John Felix) Korecki who was born in 1884 and holds a diploma from the Chicago Medical School for 1921. He is licensed to practice medicine in Illinois, is a member of the Chicago Medical Society and has qualified as a Fellow of the American Medical Association.

The Solicitor's memorandum states, further, that at the hearing, Sorokowski declared that he had discontinued the sale of Logos since about the first of the present year, because the ingredients cost too much, but that he intended to continue the manufacture and sale of Mizar and might resume the sale of Logos if the cost of the ingredients went down. The memorandum then continues:

"The evidence shows that Sorokowski has had no medical training or experience and that he employs no physician, chemist or pharmacist. His method of mixing the ingredients, as explained by him at the hearing, is very crude. He has no modern mechanical facilities and does the work himself. His knowledge of the English language is so limited that he must have letters written to him in English by prospective customers translated by some one else, usually by a person named Tony Kuczer, who conducts a small piano and music selling business in Chicago, and who handled Sorokowski's medical business while the latter was in Europe recently.

"Sorokowski purchases the horse marrow from a person whose name he could not recall, who, he states, brings it around from time to time. Asked how he could tell the material was from healthful animals, Sorokowski stated that he could tell by looking at it. With respect to the lamb marrow, he stated that he buys the bones in a grocery store and extracts the marrow himself. The vaseline, he stated, he purchases from the Standard Oil Company and the silicate from a drug store. As already noted, the roots or herbs are purchased from florists.

"The evidence shows, and I so find, that this is a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises. I therefore recommend that a fraud order be issued against the names set forth in the caption of this memorandum."

As a result, Postmaster General Walter F. Brown on October 8, 1929, issued a fraud order against Joseph Sorokowski, Z. Joseph Sorokowski, Josef Sorokowski and J. Sorokowski.

Mitchell, Physician and Writer.—S. Weir Mitchell, at fifty-three, when he was one of the world's leading neurologists, wrote his first novel, having been advised by Holmes, while he was still in his twenties, to hide literature in his desk until medicine was full grown. At that age, when medical success made long holidays possible and his natural inclination made idleness impossible, he turned to what, except for stern need, would have been his life work. We first, as Osler says, go to other centuries to find such a combination of a life devoted to the best interests of science with literature and social distinction. He wrought not with the haste of a journalist but with the deliberate leisure of a man of letters. He has a distinction of style possessed by few of our romancers, and though, like Holmes, he was too much of an essayist ever to find himself in dialogue, his historic backgrounds are unfailingly correct, and it is only because the physician has overshadowed the author that his literary fame is not greater. He knew as much of evil and sorrow as other men, indeed he knew more than most, but he always lived "in the sunshine of life," and the tone of his books is a tonic in an age sick and weary with literary perverts.—Miller, C. J.: *Am. J. Obst. & Gynec.*, September, 1929.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

USE OF AGENTS TO PREVENT CORROSION IN DRINKING WATER SYSTEMS

To the Editor:—In a large industrial plant where there are about 5,000 people employed and drinking water is filtered by the district, coming subsequently through metal pipes which have been used for many years, is it perfectly safe to use "Rusticide" or "Fluff-Foe" in the water in order to remove the incrustations from the inner side of the pipes in the drinking water system? It is claimed by the manufacturers—the Metropolitan Refining Company, Inc., 570 Seventh Avenue, New York, and by the Garratt & Callahan Company, 1328 Broadway, New York, that it is perfectly harmless, loosening the deposits from the pipes, floating it on through the water, and leaving a coating on the metal which will prevent future rust or wear. As I am personally interested in the welfare of these 5,000 employees and not wanting any derangement of their physical condition by using water impregnated with stagnant deposits floated off by this new process, such as mold, should it be in any way injurious I would certainly appreciate advice from you in regard to the safety of using one of these means of cleaning the pipes internally, which is claimed to be harmless.

J. W. C., Washington, D. C.

To the Editor:—As you have no doubt heard, sodium silicate added in small quantities to moving water, hot or cold, in and around a piping system has a property of plating out some of the silicon on the pipe surface, thus producing a coating which is more resistant to gas corrosion than the normal iron itself. There have been several articles published on this, one of the first being by Texter of the National Tube Company, and it is my understanding that to protect their own distribution systems many municipalities are adding this chemical directly to their supply at the pumping station and before it goes into the mains at all. Rarely is the dosage in excess of one-half pound per thousand gallons of water and frequently it is less than that. Sodium silicate is more or less innocuous and does not contain any elements of any kind, so far as I know, that will be in any way objectionable if taken into the human system in very small quantities. Nevertheless, there is the disposition on the part of the same water users to object to the introduction of any kind of chemical into the water supply and now and then it is necessary to have some available data other than our own ideas on the matter to use as a basis for refuting this fear. It is quite possible that something has already appeared in medical literature on the subject and if so I should be glad if you would be willing to tell me where I could find it and also if you would state yourself whether or not you can see any possible chance of contamination developing in the case of a drinking supply with sodium silicate solution carrying approximately 50 per cent of water which is added to the supply in a quantity equivalent to one-half pound to a thousand gallons.

F. K. D., Chicago.

ANSWER.—Inquiries were made of the manufacturers of "Fluff-Foe" and of "Rusticide" concerning the composition of the products. In a letter received from the Garratt-Callahan Company the statement is made that "Fluff-Foe" Rust Eradicator does not contain tannic, caustics or any acid that is harmful to the human system and is not noticeable when added to the water system in quantities designated. On further inquiry concerning the composition of the product, the Garratt-Callahan Company stated that "the basic principle is sodium silicate, of which the material contains 26 per cent, and there is 54 per cent moisture. The balance, or 20 per cent, are chemicals that are harmless to the human system but have a direct action on the ingredients that gather in the interior of piping systems and assist with the viscosity of our material, as it establishes itself on the metal in the way of a protective film."

The Metropolitan Refining Company, Inc., state that "RUSTICIDE is a liquid having a weight of about 12 pounds to the gallon. There is absolutely nothing in RUSTICIDE which is harmful to the human system. We are confident that your study of this sample will confirm this. An analysis of RUSTICIDE will show that it is composed of Sodium Silicate, Di-sodium phosphate, Sodium Carbonate, water, starch and small amounts of tannin."

Such substances as disodium phosphate, sodium carbonate, starch and small amounts of tannic acid would not in themselves be considered as agents of potential harm when used in drinking water systems. On the other hand, sodium silicate, concerning which inquiry was made by our industrial correspondent, and also the ingredient of the two proprietaries, may be looked on with some suspicion.

Inquiry was made of the United States Public Health Service, and in due time the following reply was received from the director of the Hygienic Laboratory:

The U. S. Public Health Service has not carried out any investigations concerning the physiologic effect of the continued consumption of sodium silicate with drinking water and has practically no literature

pertaining to this subject available. There can be no question that consumption of relatively large quantities of sodium silicate would produce serious injury, characterized by a severe irritation of the gastro-intestinal tract. An accidental case of such poisoning is reported in the *Schweizerische medizinische Wochenschrift* (**50**: 1081, 1920); this deals with a man who drank by mistake 200 cc. of sodium silicate and developed severe toxic symptoms, with nausea, vomiting, severe pain, diarrhea, evidence of renal injury and fever. This case merely proves that very large quantities of sodium silicate are toxic and this toxicity is probably due to the strongly alkaline reaction of watery solutions of sodium silicate.

As to the use of sodium silicate in drinking water systems and the possible harmful effect of such water, the statement must be naturally based merely upon an expression of opinion. It certainly would seem desirable to eliminate the use of sodium silicate for this purpose altogether or, if absolutely necessary, to reduce the amount of sodium silicate much below one pound per thousand gallons of water.

In addition to the problem of sodium silicate per se, there is the matter of the material which has been loosened from the pipes by the action of the sodium silicate on them. While this condition is only transitory, it does make a disagreeable water. Whether or not the ingredients on such occasion are harmful remains to be determined.

ITCHING AFTER BATHING

To the Editor:—A white man, aged 29, well developed and well nourished, works in an office and has a home heated by hot air. Last November he developed an induration and small inflammatory patch over the tuberosity of both ischia, about the size of a quarter of a dollar, which itches slightly during the day but mostly on retiring. This persisted for several weeks and then the itching gradually grew more generalized and more intense. On retiring, his extremities become cold and like goose flesh, and as soon as he disrobes he begins to itch like fury. The skin is blanched at first and he does not get relief until he scratches enough to get the parts red. This requires about fifteen minutes, oftentimes covering the entire body, excepting his face. In the early part of this disease he did not have any skin lesions at all, the itching being just as severe over the apparently normal skin as anywhere else. Now there are small erythematous papules on the inner sides of his thighs. Over the abdomen there may appear small, elevated, blanched papules where the itching is most severe. The urine is sugar free and the blood sugar is normal. There is no kidney lesion and the blood pressure is normal. I find that the best diagnosis I can make is "winter itch." Will you kindly map out a line of treatment? Please omit name.

M.D., North Carolina.

To the Editor:—My brother-in-law, aged about 40, physically and mentally apparently perfectly normal, has been complaining for years of bathers' itch. Warm baths have practically no effect on his skin, but if he follows them by a cold shower bath his skin begins to itch furiously and the sensation lasts about fifteen minutes. This condition has been going on for years and some of the best dermatologists have been consulted about this condition. We have tried numerous remedies without any results. This man is a lover of cold baths but the torture that immediately follows is beyond description. We shall be greatly indebted to you for any information that may help to alleviate this condition.

M.D., Philadelphia.

To the Editor:—I have a patient, a professional man, 34 years old, who, as far back as he can remember has been bothered by a severe itching or nettles following each bath he takes. In the past three months the itching has become intense, lasting about half an hour. So severe is it that he is unable to stand or lie still but must rub himself continually to relieve the nettle. The number of baths he takes, whether tub or shower, hot or cold, makes no difference. Even swimming has the same effect. His general health is excellent and there is nothing to be noted on his skin. I am unable to find anything to account for this condition. I will be grateful if you will offer some method of treatment and explain the cause. Would actinic ray help? Please omit name and address.

M.D., Nebraska.

ANSWER.—1. From the information submitted it is most likely that the pruritus is of the hiemalis variety, although unusually extensive, and that a superimposed traumatic dermatitis and folliculitis has been induced by the scratching. It is probable that relief would be obtained by keeping the air of the home as humid as possible, by bathing less frequently, and then employing only a tepid bath prepared by adding a handful of powdered borax to the half tub of water, and by anointing the skin immediately following the bath with a lotion composed of one part glycerin and three parts olive oil.

2. This definitely is an instance of bath pruritus, and the external treatment is essentially that outlined for winter itch under the preceding query. In addition, however, constitutional treatment is sometimes of service. The bowels should be kept free, a plain diet employed, acid foods and stimulating drinks being omitted, the digestion carefully looked after, and the nervous system kept in proper tone. Instances are on record in which sodium salicylate or arsenic internally were thought to be of service. It would not be surprising, however, if this patient would find it necessary to forego the pleasure of a cold bath.

3. The cause of "bath itch" is not known. These individuals usually have an abnormally dry skin. Usually either hot or cold baths can be comfortably tolerated, one or the other. Soaps should be mild and used sparingly. It is probable that the actinic rays would be of but little if any service. Often such a person has a minimum of discomfort if he will dry the skin of water thoroughly, apply an oily preparation, such as that suggested in the reply to the first query, followed by a soothing dusting powder, and then dress promptly.

BLOOD SUGAR AND UREA; METABOLISM TEST

To the Editor:—1. What is the difference in the amount between the arterial and venous blood sugar? Between the arterial and venous blood urea? 2. What steps should be taken to secure a reliable icterus index when the red blood cells of the patient undergo hemolysis? 3. Most authorities advise that a basal metabolism test ought to be done before 10 o'clock in the forenoon. What would be the most probable effect on the basal metabolic rate (would the rate be likely to be higher or lower) if the test would be done much later in the day? 4. What is the *p*H range of normal urine?

HOSPITAL, Wisconsin.

ANSWER.—1. The arterial blood sugar will vary between 80 and 120 mg. per hundred cubic centimeters of blood in the fasting state. The venous blood sugar is usually lower and may go as low as 60 mg. per hundred cubic centimeters of blood. The arterial and venous blood urea is more constant.

2. The blood should be drawn under liquid petrolatum.

3. According to Du Bois (Basal Metabolism in Health and Disease)) "It is also impossible to detect any consistent change during the day. Benedict and Carpenter made a large number of studies extending through the morning hours and apparently have established this fact very clearly. The afternoon experiments are not so numerous but they give no hint of diurnal fluctuations. We might expect a small change with the rising temperature in the afternoon but this may be offset by a slight diminution of the influence of the meal taken the previous evening."

4. From 5.3 to 8.0, with a mean of approximately 6.0.

OPERATION FOR CATARACT

To the Editor:—What is the present prospect of relief from cataract by early operation; i. e., by the removal of immature cataracts? Some eye surgeons say to wait until the cataract is entirely ripe, while others say it is just about as safe to operate on an immature cataract. The right eye is in pretty bad shape, and the left eye is not much better. The patient is unable to read the newspapers.

FERDINAND J. SMITH, M.D., Milford, Iowa.

ANSWER.—It is now considered safe to operate on immature cataracts in patients past 50 when there is sclerosis of the lenses. In patients who are no longer able to read, the operation is done with uniformly good results even before sclerosis is complete. It might be advisable to remove the right cataract at an early date.

TREATMENT OF RECURRENT BOILS

To the Editor:—What further treatment can you suggest for the following case: A woman, aged 30, has for the past two years had a series or crop of small boils and abscesses. They are mostly superficial, although some require incision. They occur all over the body: external ear canal, face, hands, breasts, legs and buttocks. Wassermann blood examinations, blood sugars, urine and blood culture are all negative. She has no fever during their course and is incapacitated only during the early stage of the boil. I have used stock vaccines and "Activen" without much success. Please omit name.

M.D., New Jersey.

ANSWER.—This is most likely a recurrent surface infection and the most important measure is the daily use of an antiseptic solution, such as mercuric chloride, 1 in 5,000, in 50 per cent alcohol, most particularly about the infected areas and the skin adjoining. Efforts to increase general resistance should insure that the skin receives moderate doses of ultraviolet rays, either from the sun or from an artificial source, a dermatitis being carefully avoided. Exercise in the fresh air and plenty of sleep, good food, including fresh meat, milk, cream and eggs, are requisites. Fresh yeast benefits some patients. If it is possible to get material, an autogenous vaccine may be tried, large doses being given, beginning with 500 million and increasing.

GRAYING OF THE HAIR

To the Editor:—Is there any known cause or remedy for the condition in which gray or white hair becomes gradually yellowed and unsightly? Is the condition due to any systemic condition that may be remedied with expectation of remedying the discoloration?

W. F. PIKE, M.D., Oakland, Calif.

ANSWER.—There are no local or general causes known to explain why white or gray hair turns yellow. Dyeing the hair with one of the ordinary vegetable hair dyes is a safe measure.

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EFFECTS OF EMETINE HYDROCHLORIDE

To the Editor:—Would emetine hydrochloride cause joint pains or any other by-effects besides nausea and vomiting? How long and how large doses can one administer with safety? Please omit my name.

M.D., California.

ANSWER.—The "joint pains" may probably be ascribed to peripheral neuritis, which is one of the recognized side-effects of emetine. Diarrhea, which may even simulate dysentery, is another important by-effect to be looked out for, as its appearance may lead one to push the drug to a dangerous degree in the erroneous idea that it is due to the disease for which the emetine was originally prescribed. Circulatory failure may result, most especially from intravenous injection, which for this reason is to be condemned. The usual dose is 0.03 Gm. of emetine hydrochloride given hypodermically twice a day for ten days, or a total course of 0.6 Gm. Longer courses are not advised, on account of danger from cumulative intoxication.

SURGERY FOR PENDULOUS BREASTS

To the Editor:—I have a patient, aged about 30, with pendulous breasts, who has consulted me as to the advisability of having them removed. She has one child, aged 9 years, but was unable to nurse her at the breast. She desires this amputation not alone for cosmetic reasons, but because the breasts give her considerable trouble in that while in bed, if she desires to turn over, she must of necessity assume the knee-chest position to avoid her breasts being caught under her body in the turning process. Please give me your opinion whether or not the amputation of both breasts in a woman of this age would be detrimental or affect her general health in any way—and whether or not a complete amputation should be done. Please omit name.

M.D., West Virginia.

ANSWER.—Pendulous breasts vary considerably in size and have to be treated accordingly. As a rule an elliptic incision should be made along the lower margin and the breast inverted upward. A wedge shaped excision should be made of the breast substance, reducing it to the proper size. The incision in the breast is then closed with interrupted catgut sutures and the skin incision closed with drainage. Only rarely should the entire breast be amputated.

POISONING FROM AMMONIUM PICRATE ("EXPLOSIVE D")

To the Editor:—I wish to ask for your advice and opinion in the following case: A youth, aged 17 years, was working as a "civilian employee" in the arsenal, to which he was admitted the first part of May. May 29 he was unpacking "explosive D," which covered his face and hands and got into his eye. June 4 he reported to the arsenal physician, who treated him for conjunctivitis. June 17, the eyes and the ankles were swollen. Examination of the urine by the camp physician revealed heavy albumin and casts. A diagnosis of nephritis was made and he was advised to seek admittance to a hospital. June 17, the patient reported to me; I treated him as an ambulant patient. He went to a hospital, July 7; where a diagnosis of acute tubular nephritis was made. "Explosive D" is $NH_4\ C_6\ H_2\ (NO_2)_3\ O$. Can it cause nephritis? The anamnesis was negative; infective foci were not found. Is this nephritis a compensable occupational disease? Please omit name.

M.D., New Jersey.

ANSWER.—"Explosive D" is ammonium picrate $C_6H_2(NO_2)_3O(NH_4)$ made through the combination of ammonia and trinitrophenol (picric acid). According to Marshall, "the manufacture of ammonium picrate consists in the main of a simple neutralization of picric acid by means of ammonia either alone or in combination with ammonium carbonate. This process is not attended with any serious manufacturing difficulties or dangers, provided one excludes the possibility of leaking ammonia pipes." Toxicity attributable to ammonium picrate is probably ascribable to the trinitrophenol portion of the combination. Trinitrophenol is much used in the treatment of burns and other surgical procedures.

In the manipulation of picric acid in industry, especially in the manufacture of munitions, exposure has rarely led to conjunctivitis, dermatitis, mucous membrane inflammation, gastrointestinal inflammation, nephritis, cystitis, anuria and strangury. These patients sometimes present a pseudojaundice attributable to the picric acid, an elevation of temperature and a partial destruction of the cells in the blood.

If the exposure, May 29, was nonextensive and assuming that ordinary efforts were made to remove these chemicals from the face, hands and other portions of the body, it is unlikely that the direct effects would have extended beyond the conjunctivitis, dermatitis and mucous membrane inflammation. If, however, repeated exposure took place to lower concentrations, attributing this entire clinical condition to ammonium picrate is within the bounds of reason.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD OF OPHTHALMIC EXAMINERS: Philadelphia, Oct. 21, 1929. Sec., Dr. William H. Wilder, 122 South Michigan Ave., Chicago, Ill.

ARKANSAS: Little Rock, Nov. 12-13, 1929. Sec. Reg. Board, Dr. Sam J. Allbright, Searcy, Ark. Sec. Eclec. Board, Dr. Claude E. Laws, 803½ Garrison Ave., Fort Smith, Ark.

CALIFORNIA: Sacramento, Oct. 21-24, 1929. Sec., Dr. Charles B. Pinkham, 420 State Bldg., Sacramento, Calif.

FLORIDA: Miami, Nov. 19-20, 1929. Sec., Dr. William M. Rowlett, 812 Citizens Bank Bldg., Tampa, Fla.

IOWA: Des Moines, Nov. 7-9, 1929. Mr. H. W. Grefe, Iowa Dept. of Health, Des Moines, Iowa.

MAINE: Portland, Nov. 12-13, 1929. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Me.

MISSOURI: Kansas City, Nov. 12-14, 1929. Sec., Dr. James Stewart, Capitol Bldg., Jefferson City, Mo.

NEBRASKA: Omaha, Oct. 22-23, 1929. (Basic Science and Regular.) Sec., Mr. Ernest M. Pollard, Dept. of Public Welfare, Bureau of Exam. Bds., Lincoln, Neb.

NEVADA: Carson City, Nov. 4-6, 1929. Sec., Dr. E. E. Hamer, Carson City, Nev.

NORTH CAROLINA: Durham, Nov. 27, 1929. Sec., Dr. J. W. MacConnell, Davidson, N. C.

SOUTH CAROLINA: Columbia, Nov. 11, 1929. Sec., Dr. E. A. Boozer, 505 Saluda Ave., Columbia, S. C.

VIRGINIA: Richmond, Dec. 3, 1929. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke, Va.

WEST VIRGINIA: Morgantown, Nov. 26-28, 1929. Sec., Dr. W. T. Henshaw, Public Health Council, Charleston, W. Va.

California Reciprocal Examination

Dr. Charles B. Pinkham, secretary of the California Board of Medical Examiners, reports 28 candidates licensed by reciprocity for June, 1929. The following colleges are represented:

LICENSED BY RECIPROCITY College	Year Grad.	Reciprocity with
College of Physicians and Surgeons, Chicago	(1892)	Illinois
Hahnemann Medical College	(1906)	Iowa
Hering Medical College	(1901)	Kansas
Jenner Medical College	(1916)	Illinois
Northwestern University Med. School. (1911) Washington, (1916) Colorado	(1889) Illinois, (1907)	Tennessee
Rush Medical College	(1899)	Minnesota
University of Illinois College of Medicine	(1905)	Illinois
College of Physicians and Surgeons, Iowa	(1891)	Illinois
College of Physicians and Surgeons, Baltimore	(1904)	Connecticut
University of Minnesota Medical School	(1902)	Minnesota
Central Medical College of St. Joseph	(1897)	Missouri
St. Louis University School of Medicine	(1912), (1914)	Missouri
University of Nebraska College of Medicine	(1910), (1916)	Nebraska
Bellevue Hospital Medical College	(1895)	Illinois
University of Buffalo School of Medicine	(1915)	New York
Miami Medical College	(1901)	Illinois
Ohio State University College of Medicine	(1921)	Wisconsin
Starling Medical College	(1913)	Ohio
Jefferson Medical College	(1918)	N. Carolina
University of Pennsylvania School of Medicine	(1924)	Indiana
University of Pittsburgh School of Medicine	(1913)	Penna.
Woman's Medical College of Pennsylvania	(1907)	Illinois
McGill University Faculty of Medicine	(1903)	N. Dakota

Maine July Examination

Dr. Adam P. Leighton, Jr., secretary of the Board of Registration of Medicine in Maine, reports the written examination held at Augusta, July 2-3, 1929. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Eight candidates were examined and passed. Five physicians were licensed through reciprocity with other states and one by endorsement of credentials. The following colleges were represented:

PASSED College	Year Grad.	Number Passed
Johns Hopkins University School of Medicine	(1928)	1
Harvard University Medical School	(1927) 1, (1929)	1
Tufts College Medical School	(1926) 2, (1929)	1
Jefferson Medical College	(1924)	1
University of Montreal Faculty of Medicine	(1925)	1

LICENSED BY RECIPROCITY College	Year Grad.	Reciprocity with
Johns Hopkins University School of Medicine	(1908)	Michigan
Harvard University Medical School	(1922)	Penna.
Kansas City Homeopathic Medical College	(1896)	Missouri
Hahnemann Medical College and Hospital	(1914)	Penna.
Jefferson Medical College	(1904)	Delaware

ENDORSEMENT OF CREDENTIALS College	Year Grad.	Endorsement with
Harvard University Medical School	(1926)	N. B. M. Ex.

Florida June Examination

Dr. William M. Rowlett, secretary of the Board of Medical Examiners of Florida, reports the written examination held at Jacksonville, June 17-18, 1929. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Thirty-eight candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Birmingham Medical College		(1912)	82.5
Emory University School of Medicine	(1922) 81.2, (1929) 85.7, 86.2, 90	(1928)	85.4,
University of Georgia Medical Dept.	(1907) 83.7, (1927) (1928) 82.7, 83.7, 89.3, (1929) 82.4, 84.4, 87.1		87.6,
Northwestern University Medical School		(1928)	88.4
Keokuk Medical College		(1902)	86.8
State University of Iowa College of Medicine		(1927)	87.3
University of Louisville College of Medicine		(1929)	90.4
Tulane University of Louisiana School of Medicine	(1924) 90.9, (1929) 87, 89.3, 89.8		
University of Maryland School of Med.	(1911) 80.7, (1928) 88		
Tufts College Medical School		(1904)	83.1
Columbia University College of Phys and Surgs	(1911) 84.5, (1927) 86.5		
University of Buffalo School of Medicine		(1928)	87.9
Eclectic Medical College		(1906)	84
Ohio State University College of Medicine		(1927)	89.9
Western Reserve University School of Medicine		(1893)	78.8
Meharry Medical College		(1929)	82.2, 82.3
Medical College of the State of South Carolina		(1929)	85.4, 88.8
University of Vermont College of Medicine		(1905)	83.5
University of Virginia Department of Medicine		(1927)	85.9
Nondescript			83.6

Book Notices

THE ROBERT JONES BIRTHDAY VOLUME. A Collection of Surgical Essays. Cloth. Price, $13. Pp. 434, with illustrations. New York: Oxford University Press, 1928.

This volume, a festschrift for the seventieth birthday of Sir Robert Jones, comprises twenty-four essays on various subjects in orthopedic surgery written by as many different authors. The majority of contributors are British. The essays, though independent of one another, deal with many of the important subjects in this field. The first one traces the history of orthopedics from ancient to modern times. Important phases of surgery of the hip and knee joints are well presented in seven articles. The one contribution on scoliosis thoroughly reviews methods of treatment. Calvé's article on the disease first described by him as ostéochondrite vertébral infantile includes reports of additional cases by other authors. Naughton Dunn in a brief review of his ten years' experience in treatment of paralytic foot deformities states that in all but the mildest cases tarsal arthrodesis is essential for the best final results. Three essays are devoted to conditions of the bones; namely, acute infection of bone, fibrocystic disease of bone and dissociation of bone growth. The book is primarily for the orthopedic and general surgeon and not for the student. It affords an excellent reference book for the subjects presented. The attractive binding and large print on glazed paper as well as the numerous original and well executed illustrations make it a readable volume and it is well entitled to a place in any surgical library.

DIE GASTROSKOPIE IM RAHMEN DER KLINISCHEN MAGENDIAGNOSTIK. Von Dr. Kurt Gutzeit, Privatdozent an der Universität Breslau. Paper. Price, 9.60 marks. Pp. 97, with 46 illustrations. Berlin: Julius Springer, 1929.

This is based on personal experiences of the author in a large number of cases and is a good exposition of pathologic conditions of the stomach in the living, as seen with the gastroscope. The subject is discussed frankly, and the limitations as well as the advantages of this method of examination are enumerated. The procedure is compared with other methods, including roentgenology, with the idea of giving an honest evaluation of gastroscopy. It is stated that this method is useful in about two thirds of instances, the remainder consisting of lesions in inaccessible regions, as at the pyloric region, particularly near the lesser curvature. The author thinks that the instrument will be greatly improved when it will be possible to remove small pieces for histologic examination. Chronic gastritis seems to be a particularly difficult condition to recognize. Gastroscopy is of great value in that it permits visualization of the color, surface structure and motility, features not determined by other methods. The presence of inflammation of the mucosa with peptic ulcer is easily seen and accounts for many of the symptoms. Considerable attention is given to the complications following gastro-enterostomy. Jejunal ulcer, local gastritis, narrowed stoma and regurgitation can be recognized. There are concise yet complete descriptions of the gastroscopic pictures of ulcer, carcinoma and nonmalignant tumors of the stomach, but considerable space is allotted to the various forms of chronic gastritis, a subject, as the author remarks, which has received less and less attention from the clinician. On the whole, this little volume will be found useful to the physician who does not use gastroscopy, as well as to the one who employs this diagnostic method, because several practical but obscure features are discussed clearly and concisely. The subject matter will help to clear up some of the questions which to the present have remained unanswered.

HERMAN'S DIFFICULT LABOUR: A Guide for Students and Practitioners. By Carlton Oldfield, M.D., F.R.C.S., F.R.C.P., Hon. Obstetric Surgeon to the General Infirmary, Leeds. Seventh edition. Cloth. Price, $5.50. Pp. 560, with 205 illustrations. New York: William Wood & Company, 1929.

This book first appeared in 1894 and has since been reprinted and reedited many times. This edition, published by Carlton Oldfield of Leeds, carries out the original intention of the author to give to the practitioner more definite guidance in practice than is obtained from the regular obstetric textbooks. The book will be found of value as a ready reference, the subject matter being presented in a brief but lucid and graphic manner wherever possible. Chapters on mitigation of pain in labor and the prevention of puerperal sepsis have been added. The chapter on eclampsia has been rewritten. The latter is a direct epitome of the subject, emphasizing the significant features of the malady. The Dublin treatment used by the author is described more or less in detail, and Stroganoff's treatment is commended. Cesarean section is considered contraindicated in eclampsia as it almost doubles the mortality. Cesarean section in this book refers only to the classic operation. Other methods are merely mentioned and the reader is referred to De Lee's textbook for a description of cervical cesarean section. The chapter on contracted pelves is most instructive and is well illustrated. The treatment of rupture of the uterus is explicit, especially for treatment in the home. The use of the Carrel-Dakin method in treating this accident is interesting. The use of Bossi's and Frommer's metal dilators for rapid cervical dilation might well have been omitted in this edition. Oldfield is an exponent of scopolamine-morphine anesthesia as a routine in the first stage of labor, and reports 75 per cent success. Chloroform is used in the second stage, and ether or chloroform for operative obstetrics when surgical anesthesia is required. No mention is made of gas or of local (spinal) anesthesia or analgesia.

PRINCIPLES OF CHEMISTRY: An Introductory Textbook of Inorganic, Organic and Physiological Chemistry for Nurses and Students of Home Economics and Applied Chemistry, with Laboratory Experiments. By Joseph H. Roe, Ph.D., Professor of Chemistry, George Washington University Medical School. Second edition. Cloth. Price, $2.50. Pp. 427, with 30 illustrations. S. Louis: C. V. Mosby Company, 1929.

In this book the author has attempted to set forth the elements of chemistry that will be of immediate and practical use for the class of students for whom it was intended. It is not easy to condense the subject matter of these three broad fields of chemistry and appropriate laboratory experiments in a small book. The author has been judicious in the choice of material and in the method of presenting it. About 148 pages are devoted to the conventional subjects of inorganic chemistry; fifty-six pages to a broad outline of organic chemistry, including fats and proteins; about sixty-six pages to physiologic chemistry, and about 132 pages to laboratory experiments, half of which are blank note pages. The author has presented a creditable book adapted to the groups for which it was written, and especially for nurses. The subject matter is such that the interest of this group of students will be aroused from the general apathy they show toward the rigors of the more conventional chemistry courses in college. The experiments supplement the text matter admirably.

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DIE KLINISCHE RÖNTGENDIAGNOSTIK DER INNEREN ERKRANKUNGEN. II Hälfte. Von Dr. Herbert Assmann, ord. Professor der speziellen Pathologie und Therapie, Direktor der medizinischen Poliklinik in Leipzig. Fourth edition. Paper. Price, 35 marks. Pp. 513-1071, with 569 illustrations. Leipzig: F. C. W. Vogel, 1928.

This book deals with the clinical interpretation of roentgenologic examinations of the abdomen. It is logically written and well illustrated. The analysis of the roentgenologic observations of the gastro-intestinal tract, in parts, is thorough; that of the Graham-Cole test, however, is short, which may be due to the limited experience of the author in this phase of roentgenology. Many pages are given to the discussion of peptic ulcer, and that chapter is clearly written. The consideration of disturbances of the osseous system and the accompanying illustrations is well done. There are also many interesting plates and descriptions of disturbances in the bones associated with nervous diseases.

The work is a valuable contribution to clinical roentgen diagnosis. It is especially valuable to clinicians who are familiar with roentgenologic appearances and whose interpretation based on the pathologic conditions may be more accurately correlated with the clinical story of the patient.

ARTIFICIAL SUNLIGHT AND ITS THERAPEUTIC USES. By Francis Howard Humphris, M.D., F.R.C.P., M.R.C.S., Honorable Consulting X-Ray Physician to the American Hospital in London. Fifth edition. Cloth. Price, $3.25. Pp. 340, with 31 illustrations. New York: Oxford University Press, 1929.

This is a new and completely revised edition, many sections having been rewritten. The history of heliotherapy is discussed in condensed form from the earliest days: facts and fallacies in the use of heliotherapy are brought out, and the rationale of the use of artificial light is given. A brief description of apparatus with a comparison of the mercury quartz, carbon, and tungsten arcs is given, together with the indications for the use of each type of burner. In the chapter on general therapeutics the physiologic action, the histologic changes in the skin following irradiation, the metabolic effects, the relation of light and diet in rickets and the increased resistance to disease are discussed. The chapter on technic takes up the difference in the mechanism between the water and the air cooled ultraviolet lamps; the methods for determining the quality as well as the quantity of radiation, with a formula for producing the effect desired, are discussed, as well as a classification of the dosage and tolerance factors. The conditions to be treated are arranged by system; the indications, the technic to be used, the dangers and the contraindications for the use of ultraviolet radiation are freely discussed. Mention is made of the use of roentgen rays as a complement to ultraviolet therapy. The last chapter is devoted to red and infra-red rays, with the physics, physiology, and indications for their use. The case reports and bibliography make this book a valuable source for those who are interested in the proper administration of artificial sunlight.

POLYCYTHÆMIA, ERYTHROCYTOSIS AND ERYTHRÆMIA (VAQUEZ-OSLER SYNDROME): An Epitome Based on Parkes Weber's Book of 1921 and the Recent Literature of the Subject. By F. Parkes Weber, M.A., M.D., F.R.C.P., Senior Physician to the German Hospital, London, and O. B. Bode, M.D., M.R.C.S., L.R.C.P., Assistant Physician to the Hospital. Paper. Price, 3s net. Pp. 34, with 2 illustrations. London: H. K. Lewis & Company, Ldt., 1929.

This excellent book is a complete discussion, in outline form, of all the conditions that tend to produce an excessive number of red cells in the blood. It is intended to be a ready reference work as is apparent from its size, and it is difficult to see how it could be improved for this purpose. The extensive and well arranged bibliography enables one to go directly to the source of any phase of this subject.

THE ART OF SURGERY. A Text-Book for Students and Practitoners. By H. S. Souttar, D.M., M.Ch., F.R.C.S., Surgeon, London Hospital. Cloth. Price, $12. Pp. 624, with illustrations. New York: Paul B. Hoeber, Inc., 1929.

This covers in a brief way the principles of surgery and of regional surgery and is particularly suited for the use of undergraduate students. It is illustrated in a unique way by a large number of marginal sketches showing particularly the physical observations, and by roentgenograms. Little reference is made to the literature, but the subject matter is as a rule accurately and concisely stated. It would serve a useful purpose as a reference textbook for the practitioner.

CHRONIC (NON-TUBERCULOUS) ARTHRITIS: PATHOLOGY AND PRINCIPLES OF MODERN TREATMENT. By A. G. Timbrell Fisher, M.C., F.R.C.S., Surgeon (with Charge of Outpatients), Seamen's (Dreadnought) Hospital, Greenwich. Cloth. Price, $7. Pp. 232, with 186 illustrations. New York: Macmillan Company, 1929.

This book is an important contribution to the growing critical literature on arthritis and is tangible evidence of the increasing interest being aroused in the problem. There have been so many loose statements in the field of arthritis in general that it is refreshing to see a presentation of experiments, experiences and opinions based on interested and careful study over a long period of time. The number of close students of arthritis, though now growing, is still small, and relatively few persons are qualified to offer in extenso a publication which attempts to influence and guide the thought of others. Fisher is one of this number, and the present contribution should receive the attention it deserves.

With this preface it is permissible to remark that Fisher approaches the topic of arthritis from the standpoint of orthopedic surgery, and the views he expresses most entitled to deference are those springing from a practical and experimental knowledge of the anatomy and morphology of joint structures. Any dispassionate student of the rheumatoid problem must accord to orthopedic surgeons, as a group, the most open-minded and constructive attitude to be found among the various groups into which medicine is divided. Notwithstanding indebtedness to these workers, however, the problem of arthritis is essentially a philosophic one which includes more than mechanical considerations and invades the domains of the laboratory and internal medicine. In respect to these phases of the subject Fischer's book is less impressive and reflects an obvious attempt to include fields not primarily his own. He emphasizes and subscribes to the classic work of Nichols and Richardson in this country and is perhaps the first foreigner to accept frankly their studies as the basis of any morphologic approach. Fisher's treatment of the subject follows the general English classification into rheumatoid arthritis and osteartritis, which terms are identical with "atrophic" and "hypertrophic" arthritis, now coming to be recognized in this country. Fisher falls in with the orthodox view of English workers and many workers in this country that atropic arthritis is essentially a disease caused by infection and that hypertrophic arthritis is a disease caused by other factors of a more "physiologic" nature. He advances arguments, his own and others, in support of this, but rather weakens his main premise when, as on page 108, he says "Secondary osteo-arthritic changes may supervene upon cases of rheumatoid arthritis and may be regarded as the reaction of the joint to the damage inflicted upon it by the latter disease." One need not necessarily be out of sympathy with this view to recognize that such reasoning smacks of evidence for the commonality of the two types rather than for their rigid differentiation. Fisher recognizes, however, the importance of considering the great variety of factors that may induce arthritic change, and his contributions to the study of the general physiology of joint structures, their mechanism for absorption and secretion, reflect a sustained and important effort in research. On going further afield into a study of the general physiologic and biochemical process concerned, he gets into deeper waters. His references to the work of others on the departures in physiology concerned in the production of joint disease are not always down to date.

In respect to the publications of one group of workers, some references given in the bibliography are five years behind the current literature. The title of one journal is wrongly stated and misleading. The author omits consideration of the interesting observations of one of his own countrymen, R. Lawford Knaggs, who has published a splendid analysis of osteartritis. Thus, as one instance, on page 89 Fisher states that "osteo-arthritic changes occur with greater frequency in certain disorders, such as acromegaly, than can be ascribed to mere coincidence." In this he is apparently at variance with the large experience of Knaggs, who reviewed the wealth of museum specimens in England and France and found rather slight arthritic changes in acromegalic skeletons.

The book as a whole is published in an attractive manner and the illustrations are numerous, as might be expected in a presentation originating in the morphologic and orthopedic points of view. About half of the book is devoted to physiology,

pathology and etiology, about one fourth to symptomatology and about one fourth to treatment. The chapter on treatment contains rather extensive orthopedic considerations, but to the general practitioner, not to say the internist, it will appear brief in respect to the wealth of measures, including some drugs, of value in the treatment of arthritis.

In any work that attempts a survey of so large a field it is probably impossible for an author to cover it in a manner satisfactory to all readers, and many opportunities must present themselves, by definition, for disagreement and even criticism. Such inequalities in the development of the author's thesis, however, are of minor significance as compared with the general importance of this highly suggestive presentation of the field of arthritis by an interested observer and experimenter.

This book on nontuberculous arthritis should prove of value in bringing before other workers anatomic and pathologic considerations of a fundamental nature and should afford, especially in this country, a background of information, the lack of which accounts for many ill considered and prejudiced statements in this field. So far as one publication can achieve such an end, it should also serve to emphasize to the profession at large the great importance and wide scope of the problem presented by arthritis and rheumatoid disability.

THORAKOSKOPIE UND THORAKOKAUSTIK. Von Dr. K. Diehl, Dirigierender Arzt des Tuberkulose-Krankenhauses Waldhaus Charlottenburg Sommerfeld (Osthavelland), und Dr. W. Kremer, Oberarzt an der Heilstätte Beclitz, Beclitz-Heilstätten (Mark). Paper. Price, 20 marks. Pp. 90, with 53 illustrations. Berlin: Julius Springer, 1929.

This describes the Jacobaeus thoracoscopic cautery method of controlling of adhesions which prevent complete collapse of the tuberculous lung by artificial pneumothorax. The principles of optics involved in the use of different types of thoracoscopes are discussed and the auxiliary equipment is listed. The normal and the pathologic anatomy of the pneumothorax cavity as seen through the thoracoscope is described, with particular reference to different types of adhesions preventing complete pneumothorax collapse and to the differentiation of the types suitable for cautery division. The technic of the operation is described in detail. The authors report 71 per cent of successful results following 331 operations on 272 patients treated during a period of twelve years. The method was "without results" in 21 per cent of the patients and was followed by empyema in 4.2 per cent, by perforation of the lung in 1.1 per cent, and by pleural effusion and eventual reexpansion of the lung in 3 per cent. The mortality was 0.7 per cent. The monograph, based on wide experience and giving in detail technic, indications and results of thoracoscopic cautery, is a valuable contribution to the increasingly important subject in relation to therapeutic pneumothorax in the treatment of pulmonary tuberculosis.

PHYSICAL EXAMINATION AND DIAGNOSTIC ANATOMY. By Charles B. Slade, M.D., Visiting Physician to the Otisville Sanatorium. Fourth edition. Cloth. Price, $2 net. Pp. 196, with 43 illustrations. Philadelphia: W. B. Saunders Company, 1929.

This is a practical handbook on the physical examination of the normal body. It is thorough, yet concise. As stated in the preface, the diagnosis of specific disease conditions has been avoided, mention of the abnormal being made here and there merely to emphasize certain procedures. The book is designed for the use of students, preparatory to the study of the pathologic body. It contains a section on blood pressure and the sphygmomanometer, and closes with a chapter on physical signs in the diagnosis of pulmonary tuberculosis. It will be of distinct aid to the beginner in physical diagnosis.

THE CLINICAL ASPECTS OF VENOUS PRESSURE. By J. A. E. Eyster, B.Sc., M.D., Professor of Physiology, University of Wisconsin. Cloth. Price, $2.50. Pp.135, with 7 illustrations. New York: Macmillan Company, 1929.

The author is a professor of physiology and an attending hospital physician as well. It is not surprising, therefore, to find him presenting his subject in a manner that is both scientific and practical, based on knowledge of facts and principles derived from laboratory and experimental study and obtained by observation and experience at the bedside. This dual type of presentation, when successful, as it is here, is eminently satisfactory and convincing. There are discussed the principles underlying normal venous pressure, the causes of abnormal pressure, the methods of determining such changes, and their clinical importance. The author shows that in the final analysis a trend toward a higher general venous pressure is brought about only by a failing heart muscle. Venous pressure, then, is to the physician a valuable index of the efficiency of the myocardium. If carefully observed it will be found to be the first sign of heart weakness. While agreeing with Eyster's views as to the value of this rise of venous pressure as an early sign of failing heart, one may still feel that much the same information will be afforded, and fairly early too, by close watching for the well known cyanosis, dyspnea, râles, engorged veins, enlarged liver, albuminuria and edema together with suggestive changes in the quality, rate and rhythm of the pulse and in the size of the heart. The text is clear and makes easy reading. In only a few instances is the meaning obscure because of involved or awkward handling of words. A few typographic errors have escaped correction. Altogether, the book is highly creditable to the author. It may be warmly recommended to the clinician, for whom primarily it has been written.

NEBENWIRKUNGEN DER MODERNEN ARZNEIMITTEL V. Nachtrag zur II. Auflage des Hauptwerkes von 1923. Von Prof. Dr. Otto Seifert. Würzburger Abhandlungen. Band V, Heft 9. Von Prof. Dr. Joh. Müller. Paper. Price, 5 marks. Pp. 459-525. Leipzig: Curt Kabitzsch, 1929.

This is the fifth supplement to the second edition of this exhaustive work on side-effects of newer remedies. It includes the reports on those found in the literature together with their bibliography from May, 1927, to January, 1929. This book, kept down to date by these supplements, forms an almost indispensable reference work for those who aim to be in the vanguard of medical practice, giving not only the indications for the newer remedies but also the untoward effects that have been reported, thus serving as an important antidote to the optimistic literature of the manufacturers of many of the new preparations, with which the physician's desk is inundated.

THE PRINCIPLES OF ELECTROTHERAPY AND THEIR PRACTICAL APPLICATION. By W. J. Turrell, M.A., D.M., B.Ch., Consulting Physician, Oxford County and City Mental Hospital. Second edition. Cloth. Price, $4.75. Pp. 413, with 34 illustrations. New York: Oxford University Press, 1929.

This revised volume on electrotherapy represents a new departure in books on this subject. A detailed description of various apparatus is replaced by a concise discussion of the more important features of the apparatus, the physics and the physiologic effects of the various agencies used. The history of electricity is complete, and is related from 341 B. C. to modern times. Under general principles the action of the electric current, ionization, the rôle of voltage, and the path of the current in the body are considered. In the chapter on galvanism, the interrupted and the sinusoidal current as well as fundamental experiments by Leduc, Inchley, Chantsky and others are cited. Indications as well as contraindications for the use of these agencies are given and are illustrated with case reports. The chapter on the high frequency current is brief, but the subject matter is worth while. In the chapter on surgical diathermy, the various types of current available are described and the indications for their use are given. Concerning static electricity, the American and foreign machines are compared and their properties evaluated. Radiant energy is taken up in detail. The final chapter deals with roentgen rays and their selective action. This book fills a long felt want and it may be used as a textbook for medical students and as a reference book for general practitioners. A complete bibliography is appended.

THE PROCESS OF HUMAN BEHAVIOR. By Mandel Sherman, M.D., Ph.D., and Irene Case Sherman, Ph.D. Cloth. Price, $3. Pp. 227, with 15 illustrations. New York: W. W. Norton & Company, Inc., 1929.

This book reflects a series of experiments carried on in various institutions to establish, if possible, the factors that determine the behavior of the infant and, therefore, later in life, of the adult. It is a continuation of the experiments of Watson, and a consideration of their applicability and of the literature on related subjects. The book may be considered a monograph in a new field, opening up the subject rather than establishing any definite conclusions. The authors postulate definite types of emotional response and provide definitions of normality and abnormality that are in accord with modern conceptions.

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Miscellany

AUTOCARE VERSUS MEDICAL CARE*

EDWARD A. FILENE
President, William Filene's Sons Company
BOSTON

By "autocare" I mean the kind of care and attention which owners of automobiles usually lavish on their cars. I want to contrast that sort of attention with the lack of care most people give to their own bodily machinery. The problem of medical care is far from a satisfactory solution—satisfactory either to the physician or to the patient. The application of some of the principles of autocare to the field of medical care would go far toward such a solution.

It takes two to do business—in medicine as well as in selling socks. As I am as likely as the next man to do business with a physician tomorrow, I claim a stake in how the business should be conducted. Naturally, being a business man, I see no insult to the medical profession in admitting that it has its business side. Physicians, like the rest of us, have to make a living—even if they do dispense more charity and a great deal more science in the process. As a business man of forty years' experience, I have had to deal with many problems of business and social organization. I feel, therefore, that there is less presumption in my speaking of medical organization than of medical science—of the social and business machinery which has been created to bring medical science to the service of the people who need it. Medical science is kept constantly up to date, but the organization by which it is applied is way behind the times. That is the conclusion to which at least this particular party of the second part in the business of medicine has arrived. I am convinced that medical science travels by airplane in an age of aviation, while medical organization lumbers along in a stage coach.

MEDICAL COSTS CAUSE UNREST

As one of the great medical service buying public, I submit that we customers have cause for dissatisfaction. If we happen to be rich we must pay not only for our own treatment but for that of our poor relations—and of the poor with whom we claim no relationship at all. If we are poor we must go to a clinic and become objects of charity. If we are neither rich nor poor, one serious illness in the family may put us so seriously in debt as greatly to hamper or destroy our progress and happiness.

I do not think I exaggerate when I say that the high cost of sickness, at least among the middle classes, is as potent a cause of social unrest as poverty among the poor—for in the long run they produce the same result. I know of person after person—some of them members of our store staff—whose lives have been twisted and warped by the financial burdens of illness. One sometimes doubts whether, in some instances, the cure did not cause as much or more suffering—of a different sort, no doubt, but suffering just the same—as did the disease itself.

THE PHYSICIANS SUFFER TOO

But the patient is not the only one who suffers from the present system, or lack of it. Physicians, hospitals and medical scientists generally have their own economic difficulties—just as a department store or any other business would have which operated on the same basis. Except for a few so-called successful practitioners, who serve largely a wealthy clientele, the average physician is rewarded with a ridiculously low return for the great service he renders to the community. His collection problem would stagger the accounting department of a big department store; and most hospitals must be dependent largely on charitable gifts if they are to exist at all without becoming a part of the government machine.

Something must be done about this situation by the medical profession or the public will take it in hand, as has been done—none too successfully—in some of the leading European nations. And let me say with all the emphasis I can command that I prefer voluntary action to state enforcement—in this and every other field. Self-help by those directly concerned with any economic or social problem is always better for them, and for the public in general, than compulsion exercised by government officials; it is even better for the government.

Any solution of this problem of medical care must be predicated on incomes for physicians and medical assistants which are wholly adequate to their needs and rights as members of one of the world's most useful and respected professions. No solution will be satisfactory that does not satisfy the legitimate economic claims of physicians as well as of patients.

It is because of my own belief in voluntary action and in fair treatment for all concerned that I am a supporter of the Committee on the Cost of Medical Care. This committee, as is known, includes representatives of the American Medical Association and of the public, as well as several leading economists. The committee is dedicated—through a five-year research into every conceivable angle of the problem—to the task of suggesting some way out; some way by which the average man with an average income may receive adequate medical protection against a physical or mental breakdown as well as medical help in case of need at a cost within his means. In my opinion no study could promise more beneficient social results than this.

I want also to make myself clear on another important point. I do not, nor do I see how others can, blame any one for the difficulties we are in. The situation is not caused by the selfishness or the malice of any individual or group. Like all of our major social problems, it just happened; and, like them, it will go on happening until we exercise some collective control over it—until medical men apply as much science to medical organization as they have applied to their art.

Physicians have something of value to sell the public—something of immeasurably greater value than almost anything else in the world—health. The public wants to buy it—often must buy it. The problem is to devise some method or organization whereby the price of this commodity can be set at a figure which all the people can afford to pay and which, at the same time, will produce a reasonable profit for the support of those who sell it.

It may be heresy, but I believe that if the basic economic issues involved in the practice of medicine were admitted and recognized, rather than avoided or cloaked with high-sounding phrases, we should not detract but add to its dignity; and, incidentally, go a long way toward the solution of its difficulties.

LOW PRICES INCREASE INCOME

For years I have pointed out the advantages, to merchants and the public alike, of reducing the costs of distribution so that prices might be brought down and a wider range of goods offered within the buying capacity of a continually larger number of people. The almost incredible growth of chain-store merchandizing is proving the practical value of this theory; and the process has only begun.

Before Ford applied his epoch-making theories, only the rich could afford automobiles—just as now only the rich can afford adequate medical service. Now there are 25,000,000 autos in the United States—about one for every family; but most of those who own cars find difficulty in buying medical care.

Do not be alarmed. I am not going to suggest belt conveyors for clinics or chain offices for physicians or a nation-wide hospital merger. But I do maintain that in the organization and sale of medical service both physicians and patients might to advantage steal a page from modern business practice.

* Condensed from an address delivered before the American Hospital Association Convention, Atlantic City, N. J., June 18, 1929.

PERIODIC EXAMINATIONS A BOON

The miracles which Mr. Ford and others have worked in bringing the automobile within the price range of the masses have been based primarily on the economies of large-scale operations and fairly predictable sales. I believe that the inauguration by the nation's physicians and patients of a system of periodic examinations would produce much the same miracle for medical service. I am convinced that adequate medical care might be brought within the purchasing power of every American family as well as automobiles.

In the first place, periodic health examinations would be good for the patient who pays for them—if the individual who keeps a careful check on his health can be called a patient at all. The same care he gives to his automobile will produce even more valuable results when applied to the human machine.

I base this opinion on the application to medicine of the old adage that "an ounce of prevention is worth a pound of cure." The man or woman who goes to a physician for a thorough examination every six months or a year is far less likely to become incapacitated later, or to be removed altogether from this earthly scene, by some serious disease. No athlete or prize fighter would think of doing his business without a continuing medical check-up, but business men of twice the age, under far more mental if not physical strain, seldom think they need it. Yet an expenditure of a few dollars every few months for such a check-up is more than likely to obviate the necessity of paying hundreds or even thousands of dollars for the cure of some disability that may later get out of hand.

PHYSICIANS COULD CHARGE LESS

But if a system of periodic medical examination is good for the patient, consider its effect on the physician. It creates a situation in which he not only can predict his professional activity with far greater accuracy but can approximate the mass methods which have brought such amazing gains in business—both to producers and to consumers of goods.

To put it in terms of current economics, by doing a larger amount of business at less cost per unit, the physician can charge less per unit and yet make as much, if not more income for himself. In this case one man's gain is not another man's loss, as the old economics would have it; but one man's gain is the other's gain as well. There is furthermore a double gain for the other man; not only does he pay less in the long run for actual medical care rendered but he is also less likely to be sick. I wish I could offer the public as good a "buy" as that in our store. Imagine it; lower prices for socks and also less need of socks!

Let us assume that I am a physician. I have, let us say, 267 patients—or, rather, 267 people have called on me for treatment during the past year who, I have every reason to suspect, will come back to see me again if they happen to need treatment. As things are now, I have not the remotest idea of how many of them actually will come to my office next year. If I only knew I could decide definitely whether or not to engage that secretary-nurse I have been considering, and to invest in that new fluoroscope and operating table.

EVERY ONE COULD PAY

If each one of these 267 agreed to call at least twice next year for a routine examination, I should know just how to plan my capital investment and to frame my operating budget. Not only would I be able to equip and run the office better, and so serve my patients more efficiently, but I could afford to make my charges lower; low enough, perhaps, so that Mr. Jones could pay his bills (thus saving the wastes of trying to bring dead accounts to life). Then, too, Mrs. Fish would not be so incensed at the price I have to charge her now to make up for the loss in Mr. Jones, and to secure me against the risk of not doing any business with her or Mr. Jones at all.

To get down to bare figures, I need charge only $6.25 a month—about 20 cents a day to each of my patients—in order to give me an assured net income of $20,000 a year. And that would mean only ten regular examinations for me to make a week—which would leave a considerable leeway for additional service to those who were actually ill.

A system such as this would, as a matter of fact, materially decrease the amount of sickness I would be called on to treat—and, be it carefully noted, it would be distinctly to my advantage to keep my patients well. I should get my $20,000 a year if none of them became sick, and I would get no more for the extra work involved in treating those that did.

OTHER WASTES ELIMINATED

Some other specific wastes could be eliminated to reduce my operating costs, as follows:

1. The outlay of time and effort per patient is much less if he can come to my office than if I have to make a trip to his home—as I usually do when he is even slightly ill.

2. All diseases are easier to treat when they are in their incipient stages. By catching them early, the outlay necessary to produce a cure is far less than it otherwise would be.

3. If I knew more precisely the amount of business I would do, and if its flow were stabilized, I could plan the use of my time with far less waste.

All these economies could be carried even further if I pooled my own business—at least to a certain extent—with that of a group of other physicians. Without giving up our individual professional independence, we might share a good many overhead expenses which each one of us now has to bear entirely himself. We might share in the upkeep of an office building—heat, janitor and nursing service, and so on. We might use cooperatively a wide range of highly expensive and specialized medical apparatus which no one of us would use continuously alone, and often could not afford to buy independently. We could have our own subsidiary services of various kinds—roentgen ray, photography, laboratory, and so on. If I could cut down on my overhead in this way, I could reduce my costs even further without reducing my profits.

COUNTING THE COSTS IS NEEDED

Whether medical costs can be reduced far enough for the profession to be put on a strictly business basis I do not know. On this point we should get invaluable evidence from the Committee on the Cost of Medical Care. No one knows today even how much medical service costs, or in what proportion the burden of meeting it is divided. Much less can any one make a guess as to just how far the costs can be reduced.

I am not enough of a preacher to believe in miracles. I know that this problem of the high cost of sickness cannot be solved over night. I am not sure that it can be completely solved in a lifetime. But I do see certain practical and concrete ways in which progress is now being made toward a solution. I also see other ways in which further progress might be made.

WHY NOT MEDICAL GUILDS?

Why should we not have what might be called "medical guilds?" Suppose a group of fifteen or twenty physicians should get together and pool their resources in the creation of an efficient business organization—owned and operated by them—for dispensing medical service on the basis of a periodic examination for a fixed annual fee. Might not such groups, widely organized throughout the country, go further than any agency has yet gone in the solution of our problem?

Consider what these medical guilds might do. Among the members of a guild one or two would be skilled general diagnosticians, the others would be specialists in the various branches of medical science—a nose and throat specialist, a gynecologist, a pediatrician, one or two dentists, a neurologist or two, and so

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on. All of them would have their offices in the same building. They would all share in the operating overhead and in the expense of those facilities and apparatus which might be used jointly by them. They would employ an expert in scientific business management to carry on their business operations, such as upkeep and management of the plant, and accounting.

They would offer their services not as individuals but as an organization. They would sell to the public not ten or fifteen separate and disconnected special branches of medical care but a well rounded, complete and self-contained medical service. The guild's patients would not be put to the exasperating nuisance of going from one end of the city to another, from one physician, with his own set of questions and records, to another, in search of specialized advice on one or more angles of their particular disabilities. The guild's general diagnostician would refer each patient to the guild specialist best equipped to give the special treatment indicated—in the same building and using a single set of records.

THE MODERN "FAMILY DOCTOR"

Such a guild of physicians would create a modern collective substitute for the family doctor. While it can never, of course, convey the sense of an individual personality to its patients, it might at least furnish a single organization which would minister to all their ills. They would feel that in going to it they would get the best kind of treatment, no matter what their ailments might be. It would also apply to the practice of medicine those basic principles of scientific management which have worked such wonders in the business world.

5 Park Square.

Medicolegal

License Revocable by Court, Not by Board

(Cavassa v. Off et al. (Calif.), 274 P. 523)

The California state board of pharmacy sought to cancel the registration of Cavassa as a licensed pharmacist, because of his conviction of a third offense under the state pharmacy act. He applied to the superior court, city and county of San Francisco, for a writ of prohibition. From a judgment denying the writ, he appealed to the supreme court of California, where the judgment was reversed. This opinion of the supreme court supersedes an opinion of that court rendered in *Cavassa v. Off et al.*, 265 P. 1022, J. A. M. A. **92**:417 (Feb. 2) 1929.

Section 6 of the pharmacy act requires the secretary of the board of pharmacy "to erase from the register the name of any registered pharmacist or assistant pharmacist . . . who in the opinion of the board has forfeited his right under the law to do business in this state." Section 12 provides in part that "any person convicted of violating the provisions of this act the third time shall in addition to the penalties hereinbefore mentioned have his or her registration as a pharmacist canceled." The board contended that the provision in section 12, just quoted, itself revokes a license of a pharmacist who has been convicted a third time and that the requirement that the secretary of the board cancel the registration of a pharmacist when he has forfeited his right to do business calls for nothing more than a ministerial act. Undoubtedly, the court said, the license of a registered pharmacist may be revoked as provided in section 12, and when it has been so revoked the name of the pharmacist may be erased from the list of registered pharmacists. For a license to be revoked, however, there must be some board or court or other power authorized to declare and order such revocation. The supreme court was convinced that in enacting section 12 the legislature intended the revocation or cancelation of a license for a third conviction to be a part of the penalty to be inflicted by the court. That section does not, the court continued, in any way attempt to authorize the revocation of a license by the board on the third conviction of the licentiate. Had the legislature intended to invest the board with such power, a provision to that effect would have been included in section 7 or section 9, where four causes are specified for which the board may revoke licenses. The express mention of these four causes would seem to exclude all other causes.

The court which found Cavassa guilty did not cancel his license, and the record did not show that his prior convictions were alleged in the complaint or that proof concerning them was offered at the trial. Where a prior conviction is relied on to empower the court to inflict a penalty the indictment or complaint must allege such conviction and, unless admitted, it must be proved by competent evidence. Since no allegation nor proof of the prior convictions was before the trial court which convicted Cavassa of the third offense, that court had no authority to cancel his license. And since the board had no authority to cancel Cavassa's license or to erase his name from the list of registered pharmacists, the supreme court held that the superior court erred in not granting him a writ of prohibition to prevent the board's doing so.

Menopause Following Application of Roentgen Rays to the Head

(Rulison v. Victor X-Ray Corporation (Iowa), 223 N. W. 745)

The Victor X-Ray Corporation, through one Watson, was installing a second-hand roentgen-ray machine in a physician's office, with a view to its sale. To make a demonstration, Watson requested the physician's office secretary and assistant to submit to an exposure to the machine. She did so, and later, claiming to have been injured thereby, brought suit. Judgment was rendered in her favor. The defendant appealed to the supreme court of Iowa, but the judgment was affirmed.

In demonstrating the roentgen-ray machine that it had installed, the defendant, through its agent Watson, applied the cone to the plaintiff's head and took three pictures in succession, with brief intervals, at one sitting. The focal point was the occipital lobe of the brain. Some days later the plaintiff began to feel soreness in her head. Subsequently she lost her hair from an area four inches square. She became subject to a chronic condition of sick headaches, referred to in the record as "ophthalmoplegia migraine." The "muscles of accommodation of the pupil" of her right eye ceased to function, and the eyelid was affected. The menopause came on, although the plaintiff was only 36 years old. Watson testified that nothing occurred that would have caused a burn. He estimated the dosage at 580 milliampere seconds, concededly a normal dosage that could not result in injury. The testimony on both sides, however, indicated that the loss of hair was the result of a second degree roentgen burn and that it could not have occurred if less than 1,200 milliampere seconds had been applied. A technician who saw the demonstration testified that its duration was longer and the distance from the focal point shorter than were indicated by Watson. She testified, too, to the heating of wires, which required an interval of stoppage to cool them and indicated a want of control of the dosage. The defendant contended that there was no evidence of negligence, but the supreme court was of opinion that there was enough to take the question to the jury.

The defendant took exception to the refusal of the trial court to withdraw from the jury all evidence concerning the plaintiff's menopause and the impairment of her vision, claiming that there was no evidence to show a causal relation between those conditions, if they existed, and the application of the roentgen rays. The court pointed out, however, that Dr. Heagey, a witness for the plaintiff, testified that the third cranial nerve, which controls substantially all of the muscles of the eye, has its origin about the focal point toward which the roentgen rays were directed, that an overdosage of roentgen rays causes a swelling of the blood cells, which results in an obstruction of the circulation and breaks down the smaller veins, and that any breaking down of the circulatory system necessarily shuts off the blood supply to parts of the body dependent on it. Dr. Heagey testified, too, that although roentgen rays would not be applied to a woman's head for the purpose of producing sterility, yet an excessive dosage of roentgen rays might penetrate to more or less remote parts of the body, and the position in which the plaintiff was placed for the purpose of demonstrating the roentgen ray apparatus was such as to permit the roentgen rays to penetrate the abdomen. This testimony, in

the judgment of the court, was sufficient to go to the jury for determination as to whether the impairment of the plaintiff's vision and the early appearance of her menopause were caused in the manner claimed.

Paralysis of the Anterior Crural Nerve Following Appendectomy; Liability of Anesthetist

(Telaneus v. Simpson et al. (Mo.), 12 S. W. (2d) 920)

The plaintiff, Telaneus, suffered from paralysis of the right crural nerve after an appendectomy performed by the defendant Simpson. Simpson's partner, Grace, administered the anesthetic. Telaneus alleged malpractice by Simpson and Grace and obtained a judgment against them in the circuit court, Caldwell County. They appealed to the supreme court of Missouri. There the case was reversed and remanded.

Telaneus was examined by Dr. Hoxey, Aug. 5, 1920, who found evidence of appendicitis. He was examined about a month later by his family physician, Dr. Grace, and by Dr. Grace's partner, Dr. Simpson. They concluded that he had appendicitis, and, September 4, Dr. Simpson performed an appendectomy, Dr. Grace administering the anesthetic. Telaneus testified that when he went to the operating room there was nothing wrong with his right leg and that when he came from under the influence of the anesthetic the leg was numb and he could not "move it up." He had to use crutches for about six months and then to use a cane for about a year. After that time he discarded the cane, but atrophy and a lack of control of the muscles remained. The incision extended farther down toward the groin than in ordinary cases of appendectomy. This was explained by the defendants, who testified that when preparing Telaneus for the operation they found a lump in his abdomen, down toward the groin, and decided that it should be explored to ascertain whether it contained pus. The operation disclosed, Dr. Simpson testified, that the lump was a neuroma, a tumor of the anterior crural nerve. Dr. Hoxey's evidence, however, showed that when he examined Telaneus, one month before the operation, he found "nothing in the line of a swelling." Dr. Tichenor, a witness for Telaneus, testified, on cross-examination, that a neuroma could start its growth after August 5 and exist, September 4, but that when he examined Telaneus, October 16, he did not discover a neuroma or any other tumor. Dr. Simpson testified that he made his exploration by dissection with his fingers, wearing rubber gloves and working the tissue loose with dry gauze; he did not use a knife on the tumor, but on discovering its condition he abandoned it, opened the peritoneum and removed the diseased appendix.

At the close of all the evidence, the defendant Grace demurred on the ground that he and Simpson were not sued as partners; that he only administered the anesthetic; that the evidence showed that he was guilty of no act of negligence, and that he could not be held liable for Simpson's alleged neglect. From the cases cited to support this contention, the supreme court quoted from *Nelson* v. *Sandell*, 202 Iowa 109, 209 N. W. 440, 46 A. L. R. 1447, as follows: "It is well settled that, generally speaking, a physician who merely administers an anesthetic to a patient who is operated on by another is not liable for the negligence of the operating surgeon"; and from *Stokes* v. *Long*, 52 Mont. 470, 159 P. 28, as follows: "It is held also that where two physicians are employed on the same case and by agreement divide the service as their best judgment may dictate, they are considered as independent agents, each being responsible for his own negligence and no more." But, said the court, the applicability of the rule depends on the facts of the particular case. The petition in the present instance did not allege that the defendants were partners, but it charged them with the commission of a joint act and they filed a joint answer. After the separate demurrer offered by the defendant Grace had been refused, he joined with the defendant Simpson in a joint demurrer. Counsel for the defendants themselves cross-examined the plaintiff concerning the fact that both defendants had examined him before the operation and that Dr. Grace called in Dr. Simpson "right along at that time," when the plaintiff consulted Dr. Grace. Grace himself testified that he and Dr. Simpson were partners and that he discussed with Dr. Simpson the character of the lump before and at the time of the operation. The defendants voluntarily thrust into the case the fact that the relation of partners existed between them. The case, therefore, was not a case of two physicians independently employed, the one to perform the operation and the other to administer the anesthetic, or independently employed and making a division of services according to their own ideas. Under the circumstances, the supreme court held, Dr. Grace's claim to exemption from liability could not be sustained.

Counsel for the defendants insisted that their demurrer to the evidence should have been sustained because the conditions of which the plaintiff complained could have resulted from disease of the anterior crural nerve. There was not sufficient proof that the nerve was cut, they said, to take the case to the jury, and the jury was left to arrive at its conclusion solely by conjecture and guessing. But the defendants themselves testified that there was a neuroma or lump when the operation was performed. Dr. Hoxey testified that about one month before the operation he found no lump and Dr. Tichenor testified that he found no lump about one month after the operation. The plaintiff and his father testified as to the condition of the leg immediately before and immediately after the operation and as to statements by the defendants concerning the paralysis. The court concluded, therefore, that this demurrer of the defendants was without merit.

The defendants complained generally of the instructions given by the trial court to the jury. One of these, the supreme court found, went outside the pleadings and the evidence. It authorized a verdict for the plaintiff, but it gave the jury no guidance as to any specific act which would constitute negligence and required no finding of any specific act of negligence; it permitted the jury to base a finding for the plaintiff on any theory of negligence they might evolve out of their own minds. Another instruction authorized an award of damages for the pain and mental anguish suffered by the plaintiff as "a result of said injury," without specifying what injury was referred to, thus authorizing the jury to award damages for the physical pain and mental anguish suffered as a result of the operation for appendicitis. For these and other errors in the instructions given by the trial court, the supreme court reversed the judgment and remanded the cause.

Workmen's Compensation: Aggravation of Preexisting Disease Must Be Affirmatively Shown.—An employer is liable for compensation where an employee dies from a preexisting disease which is aggravated or accelerated by an accidental injury in the course of employment, but the burden of proof of such an injury is on him who asserts it. There can be no recovery of compensation unless there is such evidence.—*Philadelphia & Reading Coal and Iron Co. v. Industrial Commission et al. (Ill.), 165 N. E. 161.*

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Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Atlantic City, N. J., October 21-25. Dr. William P. Wherry, Medical Arts Building, Omaha, Executive Secretary.

American Academy of Physical Therapy, Philadelphia, December 5-6. Dr. Thomas L. Smyth, 111 North Eighth Street, Allentown, Pa., Sec'y.

American Association of Railway Surgeons, Chicago, November 6-8. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Physical Therapy, Chicago, November 4-7. Dr. F. L. Wahrer, 22 South Center Street, Marshalltown, Iowa, Secretary.

American Society of Tropical Medicine, Miami, Fla., November 20-22. Dr. Edwin Peterson, U. S. Naval Hospital, Washington, D. C., Sec'y.

Association of American Medical Colleges, New York, Nov. 7-9. Dr. Fred C. Zapffe, 25 East Washington Street, Chicago, Secretary.

Interstate Postgraduate Medical Association of North America, Detroit, October 21-25. Dr. Edwin Henes, Jr., 445 Milwaukee Street, Milwaukee, Executive Secretary.

Kentucky State Medical Association, Louisville, October 21-24. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Medical and Surgical Association of the Southwest, Phoenix, Ariz., November 7-9. Dr. W. Warner Watkins, P. O. Box 1587, Phoenix, Secretary.

Radiological Society of North America, Toronto, December 2-6. Dr. I. S. Trostler, 25 East Washington Street, Chicago, Acting Secretary.

Southern Medical Association, Miami, Fla., November 20-22. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Atlanta, Ga., December 10-12. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Virginia, Medical Society of, Charlottesville, October 22-24. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Western Surgical Association, Del Monte, Calif., December 12-14. Dr. Frank R. Teachenor, 306 E. Twelfth St., Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Hygiene, Baltimore

10: 269-525 (Sept.) 1929

Coccidiosis in Gallinaceous Birds. E. E. Tyzzer, Boston.—p. 269.
Strongyloid Nematode, Haemonchus Contortus: I. Acquired Resistance of Hosts Under Natural Reinfection Conditions Out-of-Doors. N. R. Stoll, Princeton, N. J.—p. 384.
Influence of Wind in Spread of Anopheles Maculipennis. N. H. Swellengrebel, Amsterdam, Holland.—p. 419.
Correction of Birth Rates for Incomplete Reporting. A. W. Hedrich, Baltimore.—p. 435.
Quantitative Studies on Dog and Cat Hookworm, Ancylostoma Braziliense: Emphasis on Age Resistance. M. P. Sarles, Baltimore.—p. 453.
Relation of Moisture to Distribution of Human Trichuris and Ascaris. L. A. Spindler, Baltimore.—p. 476.
Moisture Requirements of Eggs of Horse, Dog, Human and Pig Ascarids. G. F. Otto, Baltimore.—p. 497.
Rat-Flea Survey of Peking. M. Hertig and T. F. Huang, Peking, China.—p. 521.

American J. Obstet. & Gynecology, St. Louis

18: 303-448 (Sept.) 1929

Some Literary Doctors of Medicine. C. J. Miller, New Orleans.—p. 303.
*Mycotic Vulvovaginitis. N. W. Popoff, F. Ford and W. H. Cadmus, Rochester, N. Y.—p. 315.
*Morphology of Normal Menstrual Blood and Diagnostic Value. S. H. Geist, New York.—p. 321.
Obliteration of Vermiform Appendix. C. A. Hellwig, Wichita, Kan.—p. 332.
Gravid Uterus Didelphys Resulting in Streptococcic Peritonitis. H. J. Epstein and S. A. Goldberg, New York.—p. 342.
Clinical Use of Vaginal Spreads. M. D. Mayer, New York.—p. 347.
Intra-Abdominal Reefing of Pubocervical Fascia (Modified Polk Operation) for Cure of Cystocele. R. T. Frank, New York.—p. 354.
Ureterovaginal Fistula Secondary to High Forceps Delivery. R. E. Watkins, Portland, Ore.—p. 361.
Effects of Pregnancy on Blood Circulation in Relation to So-Called Toxemia. J. C. Beker, Arnhem, Holland.—p. 368.
*Theoretical Consideration of Etiology of Toxemias of Pregnancy. R. L. Larsen, Evanston, Ill.—p. 374.
*Diagnosis of Ectopic Gestation. T. E. Lavell, New York.—p. 379.
*Maternal Mortality in 582 Abdominal Cesarean Sections. E. M. Hawks, New York.—p. 393.
*Use of Sodium Iso-Amylethyl Barbiturate (Sodium Amytal) in Obstetrics. A. R. Robbins, J. T. C. McCallum, A. M. Mendenhall and L. G. Zerfas, Indianapolis.—p. 406.
*Caudal Anesthesia in Obstetrics. J. W. Kelso, Oklahoma City.—p. 416.
Statistical Study of Incidence of Contracted Pelves in Chinese Women and Relation to Labor and Size of New-Born. S. R. Parsons, Los Angeles.—p. 419.
Anemia in Pregnancy. J. H. Moore, Grand Forks, N. D.—p. 424.
Control of Epidemic Impetigo Neonatorum by Means of Glycerin. E. Kellert, Schenectady, N. Y.—p. 426.
Formation of Artificial Vagina from Skin Flaps. S. Rushmore, Boston.—p. 427.
Secondary Abdominal Pregnancy. T. E. Mendenhall, Johnstown, Pa.—p. 429.
New Gas Control Valve for Rubin Test. G. Mombach, Cincinnati.—p. 431.

Mycotic Vulvovaginitis.—Popoff et al. report a case of mycotic vulvovaginitis encountered in a woman, aged 25, who first noticed the clinical symptoms of the disease at the beginning of the sixth month of pregnancy. The chief complaint at this time was the marked pruritus of the vulva and vagina, a burning sensation in the vagina, and some discharge. The symptoms were persistent and progressively disturbing. The cause was found to be *Monilia psilosis*.

Morphology of Normal Menstrual Blood and Diagnostic Value.—Geist's study would indicate that the hemorrhagic vaginal discharge not due to menstruation differs so decidedly in morphology from the menstrual blood that the two can be differentiated by histologic examination.

Theoretical Consideration of Etiology of Toxemias of Pregnancy.—Larsen asserts that a further investigation of the calcium, phosphorus and magnesium metabolism, with their possible interrelationship and interdependence, may clear up, at least in part, the etiology of the toxemias of pregnancy and may provide a means of preventing and treating the conditions.

Diagnosis of Ectopic Gestation.—Lavell analyzed 410 cases. In a majority, a preceding period of unusual infertility was not demonstrated. A previous history of severe inflammatory pelvic disease was seldom reported. History of previous pregnancies closely approximates that of the married population of this age group. A large incidence of previous operations on the uterus and adnexa was revealed. The predominant type of abdominal pain is irregular, lancinating or colicky, and subject to remissions. Vaginal bleeding is most frequently irregular and scanty. Actual fainting or its minor manifestation of sudden weakness was present in at least 57 per cent of the cases. This symptom is almost pathognomonic and, in relation to the type of abdominal pain and vaginal bleeding, will establish a diagnosis in the largest number of cases. Except in the presence of infection or of recent hemorrhage, the temperature, pulse, blood pressure, blood count and sedimentation time are approximately normal.

Maternal Mortality in 582 Abdominal Sections.—In 582 abdominal cesarean sections done in a single hospital by a large number of obstetricians during the past nineteen years, Hawks asserts that there were twenty-two deaths (3.6 per cent). These deaths formed 16 per cent of the total obstetric mortality. The average incidence was 1.6 per cent. In sixteen years it rose from 0.2 per cent to 3.2 per cent. In the last two years it has dropped to 2.5 per cent. The mortality following cesarean section increased 2 in 10,000 deliveries. Section has been a factor in the reduction of the total mortality. Peritonitis was the chief cause of death. It has been eliminated in the last three years by the use of the newer types of cesarean section.

Use of Sodium Iso-Amylethyl Barbiturate in Obstetrics.—Robbins et al. found the best procedure in the average 125-pound (57 Kg.) woman was from ⅛ to ⅙ grain (8 to 11 mg.) of morphine, from $\frac{1}{150}$ to $\frac{1}{200}$ grain (0.4 to 0.3 mg.) of scopolamine and from 6 to 9 grains (0.390 to 0.585 Gm.) of amytal intramuscularly when contractions were regular and were occurring in less than ten minute intervals. The injection of sodium amytal was repeated as indicated. An intravenous injection was usually given at the beginning of the second stage in amounts of from 6 to 10 grains (0.390 to 0.650 Gm.). It was administered slowly during several pains, and was stopped when the patient was well controlled. In some instances the patient's arms and legs had to be restrained in order to avoid disarrangement of the draping. The intravenous method of administering the drug was used. The most serious objection to the use of sodium amytal as an analgesic was the difficulty in controlling patients who became very restless. This drug has the advantage of being rapid in its action and of having a wide range of safe dosage. There has been no evidence of harm to the mother. Labor is probably not delayed. Labor may be rendered practically painless. Obstetric operative procedures are much more easily carried out under ordinary anesthetics when the operation is preceded by sodium amytal. Danger to the baby has not been proved. Prompt and complete control of eclamptic convulsions is possible. As a general anesthetic agent for cesarean sections and other obstetric operations and especially for patients having tuberculosis or toxemia of pregnancy, sodium amytal bids fair to supplant the inhalation anesthetics.

Caudal Anesthesia in Obstetrics.—In the thirty-four cases reported by Kelso, he made free use of morphine and rectal analgesia for the first stage and completed the delivery under caudal anesthesia with procaine hydrochloride, from 20 to 60 cc. of a 0.5 to 2 per cent solution. He concludes that the administration of caudal anesthesia in obstetrics is technically difficult and results are not uniform. It should be given only under the strictest precautions and therefore cannot be used in the average home delivery. There is difficulty in timing its administration, since it is often given too late in multiparas and too early in primiparas. Caudal anesthesia produces a

certain amount of inertia in practically every case, from a slight reduction to a complete abolishment of the uterine contractions, necessitating operative deliveries for the completion of the labor. It produces definite toxic manifestations in the mother and, with but little question, is the cause of fetal distress. It does not relieve the pain from the uterine contractions when an inertia does not develop. Since these pains are apparently almost as distressing as the pain from the delivery of the head over the perineum, adequate relief is not obtained for the patient. Caudal anesthesia is not satisfactory for spontaneous deliveries.

American J. Pathology, Boston

5: 439-543 (Sept.) 1929

Intracranial Chordoblastoma: Two Cases. P. Bailey and D. Bagdasar, Boston.—p. 439.
Intravital Staining of Microglia with Trypan Blue. D. S. Russell, Montreal, Canada.—p. 451.
Abnormality of Cerebrum and Leptomeninges Simulating Intracranial Tumor. R. C. Buckley and E. M. Deery, Boston.—p. 459.
Tissue Culture Studies of Glioblastoma Multiforme. R. C. Buckley, Boston.—p. 467.
Production of Allergic Inflammation in Kidneys. O. E. Hepler and J. P. Simonds, Chicago.—p. 473.
Effect of Combined Potassium Iodide and Thyroid Substance on Thyroid Gland. S. H. Gray and J. Rabinovitch, St. Louis.—p. 485.
Pathologic Histology of Suprarenalectomized Cats. H. E. MacMahon and R. L. Zwemer, Boston.—p. 491.
Congenital Anomalies of Liver. H. E. MacMahon, Boston.—p. 499.

Annals of Internal Medicine, Ann Arbor, Mich.

3: 199-294 (Sept.) 1929

On Milder Affective Disorders. L. F. Barker, Baltimore.—p. 199.
Tuberculosis Theses: Diagnostic, Prognostic and Therapeutic. L. Brown, Saranac Lake, N. Y.—p. 206.
Fundamental Clinical Aspects of Deficiencies. G. R. Minot, Boston.—p. 216.
Physiologic and Biochemical Aspects of Deficiencies with Reference to Vitamin B. G. R. Cowgill, New Haven, Conn.—p. 230.
Treatment of Angina Pectoris. H. Brooks, New York.—p. 242.
Coronary Problem. A. R. Elliott, Chicago.—p. 252.
Fatigue and Infection. W. L. Holman, Toronto, Canada.—p. 259.
*Tobacco Smoking and Gastric Symptoms. I. Gray, New York.—p. 267.

Tobacco Smoking and Gastric Symptoms.—Analysis of hundreds of cases has convinced Gray that tobacco smoking should be considered an etiologic factor in gastric functional disturbances. Individual sensitivity, rather than the amount of tobacco consumed, appears to be the determining factor as regards the symptoms. Gastric secretory and gastric motor response in individuals with functional gastric disturbances due to tobacco smoking vary, despite the similarity in clinical symptoms. Approximately one fourth of individuals with gastric functional disturbances attributable to tobacco smoking show a hyperacidity, and about one fifth a subacidity. In peptic ulcer, tobacco smoking usually causes an increase of gastric secretion during the fasting stage and a hyperacidity in about one third of the number. Clinical improvement in some of these patients with ulcer occurs only after cessation of smoking. The withdrawal of tobacco in these patients is most advisable. The therapeutic test, and not the chemical and roentgen observations, is the criterion as to whether or not a person should smoke.

Annals of Otol., Rhinol. & Laryngology, St. Louis

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Vitamins in Human and Animal Nutrition. R. A. Dutcher, State College, Pa.—p. 593.
Diet in Connection with Diseases of Lymphatic System, Especially Upper Air Tract. R. A. Barlow, Rochester, N. Y.—p. 600.
Relation of Deficiency Diet to Diseases of Sinuses. L. W. Dean, St. Louis.—p. 607.
Deficiency Diet in Relation to Skeleton, Especially in Connection with Bone Affections of Head. B. R. Shurly, Detroit.—p. 612.
Necessity for Scientific Investigation of Causes of Hypertrophy of Lymphoid Elements of Pharynx. D. B. Delavan, New York.—p. 622.
Deafness in Syphilis: Audiometric Study. D. W. Drury, Boston.—p. 625.
Further Experience with Dichloramine Treatment of Mastoid Wounds. R. A. Fenton, Portland, Ore.—p. 657.
Contribution to Study of Chronic Progressive Deafness: Plea for Nation-Wide Investigation. T. J. Harris, New York.—p. 661.
Infection by Brucella Melitensis Var. Abortus Complicating Tonsillectomy: Case. G. Fetterolf, Philadelphia.—p. 675.
Sinus in Perspective. A. W. Proetz, St. Louis.—p. 682.
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Specific Protein Reactions in Eye, Ear, Nose and Throat. G. Piness and H. Miller, Los Angeles.—p. 691.
Mixed Tumor of Parotid Type Growing from Posterior Aspect of Thyroid Cartilage: Case. R. C. Lynch, New Orleans.—p. 706.
Chronic Ethmoiditis: Conservative Surgical Treatment. R. H. Skillern, Philadelphia.—p. 716.
Histopathology of Sinusitis and Mastoiditis. B. J. McMahon, St. Louis.—p. 732.
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Limitations of Functional Tests in Differential Diagnosis of Deafness. E. P. Fowler, New York.—p. 766.
Anatomic Studies of Sphenopalatine Ganglion and Posterior Palatine Canal: Use of Latter as Injection Route of Choice. E. H. Campbell, Philadelphia.—p. 778.
Chronic Nonpurulent Sinusitis and Clinical Significance. F. B. Kistner, Portland, Ore.—p. 795.
Use of New Magnesium Alloy Tuning Forks. R. Sonnenschein, Chicago.—p. 805.
Nontuberculous Lesions of Larynx in Tuberculous. J. B. Greene, Ashville, N. C.—p. 812.
Education of General Physician and Public to Sinus Problem. H. B. Lemere, Omaha.—p. 820.
Function of Muscular Attachments of Tonsil. H. A. Trotter, Buffalo.—p. 825.

Archives of Internal Medicine, Chicago

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*Treatment of Pyuria Due to Bacillus Coli. A. H. Johansen, Boston.—p. 303.
*Benign Gastric and Duodenal Ulcers. H. R. Hartman and A. B. Rivers, Rochester, Minn.—p. 314.
*Pituitary Gland and Suprarenal Cortex. R. C. Moehlig, Detroit.—p. 339.
*Effect of Uncooked Starches on Blood Sugar of Normal and Diabetic Subjects: II. S. M. Rosenthal and E. E. Ziegler, Washington, D. C.—p. 344.
Amino-Acid Content of Blood in Health and Disease. E. G. Schmidt, Baltimore.—p. 351.
*Failure of Diabetic Patient to Utilize Dried Artichoke Powder. L. E. Westcott and E. C. Wise, Kalamazoo, Mich.—p. 362.
Cerebrospinal Fluid in Myxedema. W. O. Thompson, P. K. Thompson, E. Silveus and M. E. Dailey, Boston.—p. 368.
Diuretic Action of Parathyroid Extract. W. C. Hueper, Chicago.—p. 374.
Opium Addiction: VIII. Effects of Intramuscular and Intravenous Administration of Large Doses of Morphine to Human Addicts. A. B. Light and E. G. Torrance, Philadelphia.—p. 376.
*Arterioles in Cases of Hypertension. J. W. Kernohan, E. W. Anderson and N. M. Keith, Rochester, Minn.—p. 395.
Prolongation of Life of Nephrectomized Dogs. E. E. Lyon, A. L. Shafton and A. C. Ivy, Chicago.—p. 424.
*Action of Merbaphen (Novasurol) on Kidney of Dog. H. M. Keith and B. I. Johnstone, Detroit.—p. 438.
*Secretion of Bile in Response to Rectal Instillations. A. L. Garbat and H. G. Jacobi, New York.—p. 455.

Treatment of Pyuria Due to Bacillus Coli.—It is shown experimentally by Johansen that the disinfecting power of phenyl salicylate against *Bacillus coli* is increased by concurrent acidification of the urine. When calcium chloride and phenyl salicylate were employed together in the clinical treatment of twenty-four patients suffering from pyuria, cures were obtained in 75 per cent. Calcium chloride alone caused the development of gastric symptoms in some patients, but this was avoided by giving the calcium chloride in tablets coated with phenyl salicylate which contained the proper proportions of both phenyl salicylate and calcium chloride. Johansen gives 0.6 Gm. of calcium chloride with a coating of about 0.3 Gm. of phenyl salicylate, using three tablets three times daily for standard doses. Dyspeptic conditions did not develop in any instance, not even on ingestion of fifteen tablets a day. One of the patients suffered from dyspepsia beforehand, and his condition was not aggravated during the treatment.

Benign Gastric and Duodenal Ulcers.—Of 700 cases of duodenal ulcer analyzed by Hartman and Rivers, only 38 per cent were uncomplicated. In 44.4 per cent there was also chronic appendicitis; cholecystitis was present in 3.6 per cent; gastric ulcer in 3.6 per cent; miscellaneous lesions were found in 3.0 per cent, and subacute appendicitis in 7.4 per cent. In 375 cases of gastric ulcer, 50.8 per cent were uncomplicated; chronic appendicitis was present in 35.7 per cent; cholecystitis in 2.1 per cent; duodenal ulcer in 5.2 per cent; subacute appendicitis in 3.1 per cent; carcinomatous change in 2.1 per cent, and miscellaneous lesions in 1 per cent.

Pituitary Gland and Suprarenal Cortex.—Moehlig reiterates his belief in the embryohormonic relation of the pituitary to mesenchymal tissues. Anencephalus is accompanied by pituitary anomalies. The degree of anomaly varies in different cases, being greatest in anterior cerebral defects. The suprarenal cortex reflects the state of the pituitary gland and is always hypoplastic when the pituitary is involved in anenceph-

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alus. Hyperplasia of the pituitary gland results in hyperplasia of the suprarenal cortex. The view that cerebral defects are responsible for aplasia of the suprarenal cortex must be modified to the view that the pituitary gland is the responsible factor. Moehlig emphasizes that only the suprarenal cortex and not the medulla is involved in these pituitary anomalies, and the same holds true for experimental hypophysectomy. The importance of the relation of the pituitary gland to the suprarenal cortex is readily realized when cholesterol metabolism is considered.

Effect of Uncooked Starches on Blood Sugar of Normal and Diabetic Subjects.—Rosenthal and Ziegler state that from 50 to 75 Gm. of raw starch administered by mouth to nine normal adults produced the following changes in blood sugar: in one-half hour, an average increase of 1 mg. per hundred cubic centimeters; in one hour, a decrease of 1.2 mg., and in two hours, a decrease of 3 mg. Fifty grams of cooked starch (250 Gm. of potatoes) given to twelve persons caused the following changes in blood sugar: in one-half hour, an average increase of 56 mg.; in one hour, an increase of 51 mg., and in two hours, an increase of 11 mg. Fifty grams of uncooked starch was given to seven patients with diabetes of varying severity; the changes in blood sugar were (average): in one-half hour, an increase of 6 mg.; in one hour, a decrease of 9 mg., and in two and one-half hours, a decrease of 14 mg. One hundred and twenty grams of uncooked chestnuts, given to three diabetic patients, did not raise the blood sugar level.

Failure of Diabetic Patient to Utilize Dried Artichoke Powder.—A diabetic subject on a measured diet gave an average tolerance of 176 Gm. of dextrose daily. On the addition of powdered dried artichokes and over a period of eighteen days, the average tolerance was 170 Gm. No increased tolerance due to the addition of artichokes is evident, and Westcott and Wise conclude that this form of carbohydrate is not tolerated in any greater quantities than starch. The difference in tolerance of 6 Gm. between the artichoke period and the basal diet period is within the limits of experimental error for this type of experiment. The average daily tolerance for the entire thirty days of the experiment is 172 Gm. The long lag in the excretion of dextrose is caused by the fact that the available dextrose of the basal diet (169 Gm.) is so close to the average calculated tolerance of the patient (172 Gm.) The p_H of the feces was not appreciably changed by the addition of carbohydrate in the form of dried powdered artichokes. Westcott and Wise conclude that dried powdered artichokes have no advantage as a diabetic food.

Arterioles in Hypertension.—Clinical experience has convinced Kernohan et al. that the arterioles in voluntary muscle of ambulatory patients with diffuse hypertensive vascular disease frequently show distinctive histologic changes. These changes differ in degree and, in the opinion of the author, may afford a valuable index for predicting the ultimate outcome in the individual case.

Action of Merbaphen on Kidney of Dog.—In this study by Keith and Johnstone, five dogs were given merbaphen in amounts corresponding to doses used therapeutically in man at varying intervals for periods up to five months. When the fluid and chloride intake were carefully controlled and a sufficient period was allowed between doses of the drug, a diuresis and an increase in the urine chlorides always occurred during the twenty-four hours following the injection of the drug. On the other hand, when they were not controlled, both diuresis and increase in chloride output were inconstant. There was no constant change in the blood chlorides. The specific gravity and phenolsulphonphthalein excretion remained normal. Albumin appeared irregularly, particularly after large doses repeated at short intervals. Casts also appeared after toxic doses. When the kidneys were examined histologically, there was evidence of early degeneration from three to nine days after the final doses of the drug. Some chronic change was present. This could not be attributed to merbaphen and was considered spontaneous. The kidney of one dog dying five days after a single lethal dose showed widespread tubular necrosis similar to that observed in the kidney of the rabbit and to that shown by various writers to be produced by toxic doses of other mercury compounds in common use.

Secretion of Bile in Response to Rectal Instillations.—Facts are cited by Garbat and Jacobi which reveal that the introduction of various solutions into the lower bowel causes a definite flow of bile into the intestine. The mechanism whereby this is brought about is either a direct stimulation of the cells of the liver from the absorption of the instilled fluids into the portal system or a reflex nervous phenomenon. The former is the more probable explanation.

Archives of Ophthalmology, Chicago

2: 237-386 (Sept.) 1929

Personal Recollections of Graefe, Arlt and Donders. H. Derby, Boston.—p. 237.
Does Keratomalacia Exist in Adults? A. Pillat, Peiping, China.—p. 256.
Ocular Pathology of Periarteritis Nodosa. I. Goldstein and D. Wexler, New York.—p. 288.
Ocular Lesions in Tularemia: Two Cases. J. H. Judd, Beatrice, Neb.—p. 300.
Recurrent Dermoid Cyst. H. Gifford, Omaha.—p. 305.
Hypertensive Retinal Disease. L. T. Gager, Washington, D. C.—p. 307.
Further Visual Results with Telescopic Glasses. L. L. Mayer, St. Louis.—p. 315.
Newer Forms of Ophthalmic Lenses. A. Cowan, Philadelphia.—p. 322.
*Amaurosis Following Ingestion of Ethylhydrocupreine: Case. B. Y. Alvis, St. Louis.—p. 328.
Heterochromia Irides. F. H. Haessler, Milwaukee.—p. 333.

Amaurosis Following Ingestion of Ethylhydrocupreine.—In the case reported by Alvis, the patient ingested ethylhydrocupreine in doses of 4 grains (0.26 Gm.) every five hours with a glass of milk during three days and nights, until she had taken 58 grains (3.75 Gm.) in all. During the third night she had a high temperature (104 F.) and was somewhat irrational. Her father, acting as nurse, placed cold applications on her forehead with two cloths of different colors. She was able to distinguish between the two cloths until late in the night, when she finally slept. On awakening in the morning, she was unable to distinguish light. Examination made about five hours later, revealed widely dilated pupils, disks very pale with slightly blurred margins, retinal arteries practically obliterated, so narrowly were they contracted; and small and threadlike retinal veins. In the right macula there was a cherry spot in a moderately edematous retina; no cherry spot appeared in the left macula, but a little to the temporal side there was a round deposit of brownish pigment, apparently old. As soon as the diagnosis of ethylhydrocupreine poisoning was made, i. e., about twelve hours after the onset of amaurosis, nitrites were given in increasing doses. General elimination was instituted, in the form of potassium iodide and pilocarpine for diaphoresis. Hot fomentations were applied to improve the circulation of the eyes. Later, increasing doses of strychnine were administered. Four months later the pupils were wide and reacted sluggishly to light. The patient said that everything was seen through a purple haze which prohibited the differentiation of colors. Vision in each eye was 20/75. The visual fields were restricted temporarily from about 25 to 30 degrees, nasally from 15 to 20, below from 15 to 30, and above 15.

Archives of Otolaryngology, Chicago

10: 217-336 (Sept.) 1929

Postoperative Sinus Thrombosis. H. Brunner, Vienna, Austria.—p. 217.
Blue Drum Membrane. G. E. Shambaugh, Chicago.—p. 238.
Chondroma of Larynx. L. H. Clerf, Philadelphia.—p. 241.
Conditions of Optic Nerve Caused by Disease of Sinuses. E. S. Thomson, New York.—p. 248.
Sphenoiditis. R. S. Tillotson, San Francisco.—p. 262.
Persistence of Fetal Blood Sinuses and Relation to Middle Ear Spaces. J. P. Stewart, Edinburgh, Scotland.—p. 266.
Use of Endothermy in Laryngology. H. G. Tobey, Boston.—p. 276.
Psychologist's Interest in Hearing. M. Bentley, Ithaca, N. Y.—p. 282.
Diphtheria of Ear. D. Nussbaum, Philadelphia.—p. 296.
Optic Nystagmus Test. E. R. Carpenter, Dallas, Texas.—p. 299.
New Tonsil Suture Forceps. R. Watt, Philadelphia.—p. 300.
Acute and Chronic Otitis Media and Sinus Thrombosis. S. J. Kopetzky, New York.—p. 302.

California and Western Medicine, San Francisco

31: 161-232 (Sept.) 1929

Reminiscences of Osler in Early Baltimore Days. W. S. Thayer, Baltimore.—p. 161.
Cardiovascular Complications: Preoperative and Postoperative. H. G. Holder, San Diego.—p. 168.
Psychology in Practice of Medicine. S. D. Ingham, Los Angeles.—p. 173.

Mouth Infections in Relation to Systemic Disease. J. H. Musser, New Orleans.—p. 177.
Injuries to Back. H. W. Chappel, Los Angeles.—p. 180.
Carbon Arc Versus Quartz Lamp in Dermatologic Therapeutics. M. Scholtz, Los Angeles.—p. 183.
Desmoid Tumors: Case. G. F. Straub, Honolulu, T. H.—p. 186.
California State Narcotic Hospital: Aims and Work. T. F. Joyce, Spadra.—p. 190.
*Treatment of Parkinson's Syndrome with Fever Produced by Baths: Case. P. S. Pouppirt, San Francisco.—p. 192.
Gwathmey Analgesia. L. A. Emge and C. L. Cooley, San Francisco. —p. 195.
Ophthalmic Delusions. A. S. Green, San Francisco.—p. 198.
Lure of Medical History: Bernardino Ramazzini. R. T. Legge, Berkeley. p. 201.
Pneumenia Recurring Ten Times in a Boy of Twelve Years. H. Herbert, Los Angeles.—p. 203.
Calcium Metabolism in Marble Bone (Albers-Schönberg Disease): Case. R. G. Flood, San Francisco.—p. 203.
Carcinoma of Breast with Diffuse Carcinoma of Stomach: Case. H. S. Penn, Boston.—p. 204.
Closed Method for Transfusion of Citrated Blood. A. L. Brown, San Francisco.—p. 205.

Treatment of Parkinson's Syndrome with Fever Produced by Baths.—Pouppirt asserts that the encephalitic patient (Parkinson type) stands hyperpyrexia produced by baths very well. Presenting signs and symptoms, such as tremor, spasticity, ocular crises, pains in the muscles and feeling of stiffness, are helped in nearly every case and in a few cases are entirely done away with. The health of the individual as a whole is improved. His weight is increased; he has a feeling of well being and less depression. These treatments are useful as an adjunct in the reeducation of patients with severe sequelae of encephalitis. It occasionally enables them to be put back to useful employment when other measures have failed.

Canadian Med. Assn. Journal, Montreal

21: 257-366 (Sept.) 1929

Debt of Modern Surgery to Ancillary Sciences. A. H. Burgess, Manchester.—p. 257.
*Mechanism of Diuresis Produced by Ingestion of Water. L. Ambard and F. Schmid, Strasbourg, France.—p. 265.
Better Results in Acute Intestinal Obstruction Due to Recent Methods of Investigation and Treatment. H. A. Bruce and J. W. Rush, Toronto.—p. 269.
*Kidneys in Diabetic Coma. I. M. Rabinowitch, Montreal.—p. 274.
Erysipelas in Children. H. B. Cushing, Montreal.—p. 276.
Elimination of Rickets in Ontario. F. F. Tisdall, Toronto.—p. 279.
Nerve Lesions in Civil Practice. A. Gibson, Winnipeg.—p. 283.
Methods and Results in Perimetry. L. C. Peter, Philadelphia.—p. 288.
Late Results of Manitoba Epidemic of Poliomyelitis of 1928. M. McKenzie, Winnipeg.—p. 291.
Intratracheal Ethylene-Oxygen Anesthesia. H. R. Griffith, Montreal.—p. 294.
Congenital Tuberculosis: Case. R. R. Struthers and H. G. Mitchell, Montreal.—p. 297.
Separation of Lower Femoral Epiphysis. W. J. Patterson, Montreal. —p. 301.
Endometriosis: Three Cases. S. E. C. Turvey and W. Boyd, Winnipeg. —p. 304.
Acute Bacterial Endocarditis: Case. A. P. Hart and L. N. Silverthorne, Toronto.—p. 305.
Appliance to Protect Hands of Radium Worker. H. Mackay, Winnipeg. —p. 309.
Rebreathing in Intratracheal Anesthesia. C. C. Stewart, Montreal.—p. 309.

Mechanism of Diuresis Produced by Ingestion of Water.—Experimental evidence leads Ambard and Schmid to conclude that when water is administered by mouth it leads during its absorption into the body to the liberation of a hormone from the intestinal mucosa. This hormone is a diuretic and it produces polyuria by acting directly on the kidney cells.

Kidneys in Diabetic Coma.—Rabinowitch asserts that a positive diazo-color reaction when found in the course of diabetic coma does not necessarily indicate an unfavorable prognosis. The kidney lesion in this condition, severe as it may at times be, appears, so far as prognosis is concerned, to correspond to the many acute lesions encountered clinically and usually terminating favorably.

Illinois M. Journal, Oak Park

56: 157-232 (Sept.) 1929

Medical Diathermy in Urology: Seven Years' Results. V. J. O'Conor, Chicago.—p. 163.
Prevention of Neonatal Mortality from Standpoint of Obstetrician. W. C. Danforth, Evanston.—p. 166.
Abnormalities of Bile Ducts and Blood Vessels: Surgical Significance. E. Friend, Chicago.—p. 169.
Senile Cataract (Simplified Facoerisis). W. A. Fisher, Chicago.—p. 180.
Impressions by Retiring President of Chicago Medical Society. F. R. Morton, Chicago.—p. 185.
Anatomy and Physiology of Normal Spine and Pelvis. E. J. Carey, Milwaukee.—p. 187.
*Pregnancy and Labor in Woman Suffering from General Paralysis. B. Lemchen, Dunning.—p. 188.
Abruptio Placentae. E. D. Huntington, Chicago.—p. 190.
*Mechanism of d'Espine Sign: Significance in Tracheobronchial Gland Tuberculosis. M. Joannides and H. H. Freilich, Chicago.—p. 193.
New Urethral Dilator. L. H. Zeuch, Chicago.—p. 194.
Tularemia in Chicago: Two Cases. A. Brunschwig and F. M. Janowsky, Chicago.—p. 195.
Syphilis of Prostate. L. W. Riba, Chicago.—p. 198.
Artificial Fever Produced by High Frequency Currents. C. A. Neymann and S. L. Osborne, Chicago.—p. 199.
Cause of Urinary Retention Without Prostatic Hypertrophy. E. W. Hirsch, Chicago.—p. 203.
Traumatic Rupture of Normal Spleen. A. P. Heineck, Chicago.—p. 205.
Present Treatment of Erb-Duchenne Brachial Birth Palsy. E. D. W. Hauser, Chicago.—p. 213.
Rôle of Fungi in Occupational Skin Diseases. C. White, Chicago.—p. 219.
Acute Appendicitis in Children. W. H. Byford, Blue Island.—p. 224.
Visual and Auditory Efficiency in Schools, Industry and Commerce. C. F. Yerger, Chicago.—p. 226.
Practical Proctologic Pointers. W. A. Hinckle, Peoria.—p. 228.

Pregnancy and Labor in Woman Suffering from Paresis.—During nineteen years as a resident of various hospitals, of which seventeen were hospitals for the insane, Lemchen has seen only two pregnancies in a paretic patient. One was a miscarriage of a dead fetus, aged about 5 months, and in the second case he delivered a living and apparently normal child. The patient had syphilis and was treated with arsphenamine during the last two months of her pregnancy, the time she was under observation. While the patient was in bed, without complaining of any labor pains or any indication of pain, the membranes suddenly ruptured and in a few minutes a well formed baby boy was born. The placenta came about thirty minutes later. The baby weighed 8 pounds (3.6 Kg.) when born and was placed on artificial feeding. He took the nourishment well and was thriving. A blood Wassermann test done on the baby five months after birth was negative. The mother at present is quite demented and shows considerable muscle tremor and speech defect, characteristic of paresis.

Mechanism of d'Espine Sign.—A careful study of thirty consecutive children convinced Joannides and Freilich that the d'Espine sign is of no clinical significance when present. The sign could be elicited at various levels of the spine, and in the forward stooping position the sign could be elicited at a much lower level. They are of the opinion that the sounds referred to as the d'Espine sign are a normal blending of voice and whisper sounds that follow the natural path of transmission of sound waves. The presence of the d'Espine does not seem to indicate pathologic changes in the tracheobronchial gland. With the forward stooping position, the sound waves in the chest become intensified.

Journal of Lab. & Clin. Medicine, St. Louis

14: 1129-1244 (Sept.) 1929

*Xanthemia and Xanthosis (Carotinemia). W. C. Boeck, Rochester, Minn., and W. M. Yater, Washington, D. C.—p. 1129.
*Rôle of Streptococci in Rheumatic Diseases. J. C. Small, Philadelphia. —p. 1144.
Primary Sarcoma of Spleen (Reticulum Celled): Case. T. Howard, New York.—p. 1157.
Effect of Mercury and Sodium Oxalate on Blood Calcium. F. D. McCrea, Augusta, Ga.—p. 1161.
Alimentary Tract of Man: II. Stabilization of Gastric Reaction Patterns. W. Kuenzel and T. W. Todd, Cleveland.—p. 1165.
Respiratory Cabinet for Laboratory Animals. J. J. R. MacLeod, Toronto. —p. 1175.
Stability of Desiccated Beef Heart Muscle Powder for Preparation of Antigens for Complement Fixation Tests in Syphilis: Kolmer Method. R. A. Kilduffe and B. Shifman, Atlantic City, N. J.—p. 1182.
Metabolism Mask for Dogs. R. Gibbons, Omaha.—p. 1184.
*Detection of Blood by Means of Benzidine Dihydrochloride. S. L. Leiboff, New York.—p. 1187.
*Simple Method for Staining Spirochetes. E. Weiss, Chicago.—p. 1191.
Automatic Microtome Knife Sharpener and Methods for Grinding and Honing Knife Satisfactorily. J. I. Fanz, Philadelphia.—p. 1194.

Xanthemia and Xanthosis.—One hundred patients with diabetes and fifty-three patients suffering from other diseases were chosen at random and investigated by Boeck and Yater for xanthemia and xanthosis. Xanthemia was found in eighty-six (86 per cent) of the patients with diabetes, in twenty-two

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(100 per cent) of patients with renal disease, in thirteen (69 per cent) of patients with hepatic disease, and in sixteen (89 per cent) of patients with other miscellaneous diseases. Xanthosis was present in nine (9 per cent) of the patients with diabetes, in two (9 per cent) of the patients with renal disease and in one (3 per cent) of the patients with other diseases. Among thirty-six patients whose condition was diagnosed as xanthosis were ten with diabetes and twenty-six who had other diseases or, with the exception of the xanthosis, were normal. The majority of these patients had eaten excessively of foods rich in the lipochrome pigments; namely, vegetables, fruits, butter and eggs. The yellow color of the skin in xanthosis may lead to confusion in diagnosis through its being mistaken for icterus. The distribution of the pigment in xanthosis is characteristic. The coloring is most intense in the palms, soles and nasolabial folds, whereas the sclerotics usually are clear. A history of the patient's diet may be helpful in explaining the pigment, and determination of the lipochrome index, icterus index and serum-bilirubin permits of conclusive diagnosis. When yellow pigmentation of the skin is present and the serum-bilirubin is low and the icterus index high, the condition must be xanthosis; if the serum-bilirubin is high and the lipochrome index low, the abnormal coloration is due to jaundice; if both the serum-bilirubin and lipochrome index are elevated, xanthosis is present but is obscured by jaundice.

Rôle of Streptococci in Rheumatic Diseases.—The rôle of streptococci in rheumatic disease is discussed by Small, and an hypothesis embracing a dual nature of its pathogenesis is offered. The specific toxin of a streptococcus is suggested as operative in the production of the "destructive" and "proliferative" types of lesions in rheumatic fever, while the patient's hypersensitization to an allergen associated with the protein of streptococci is presented as concerned in producing the "exudative" lesions. The specificity of this sensitizing substance, or allergen, is not dependent on the type of streptococcus supplying it. Chronic arthritis is presented as an allergic disease, the hypersensitive state of the patient being due to this allergen contained in streptococci without regard to a particular type. The specific treatment of rheumatic fever embraces both the neutralization of the toxemia and adequate desensitization. The treatment of chronic arthritis is concerned largely with the elimination of foci harboring streptococci, and with adequate desensitization. Stock extracts of streptococci may be employed in this desensitization, and because their dosage requirements may be the better determined through extensive clinical application they are preferable to autogenous preparations.

Detection of Blood by Means of Benzidine Dihydrochloride.—A simple method is described by Leiboff for detecting blood in urine and in feces by the use of benzidine dihydrochloride. The reagents necessary for the performance of the test are a 1 per cent benzidine dihydrochloride solution and a 3 per cent hydrogen peroxide solution. One or more cubic centimeters of urine is placed in a clean test tube and diluted with distilled water to about 5 cc. One cubic centimeter of benzidine solution and 1 cc. of 3 per cent hydrogen peroxide are added. A blue color will develop in the presence of blood. The rapidity with which the color will develop will depend chiefly on the amount of blood present; it usually takes from one to ten seconds. When the amount of blood is very small, it is best to centrifugate the urine, and, after the supernatant fluid has been poured off, the sediment is placed on a glass slide and one drop of benzidine solution and one drop of hydrogen peroxide are added and the contents mixed by tilting the slide. The hydrogen peroxide must always be added last. For the detection of blood in feces, about 1 Gm. of feces is mixed well in a test tube with 5 cc. of distilled water and brought to a boil over a flame, and filtered. The filtrate is collected in a clean tube and cooled. One cubic centimeter each of benzidine solution and hydrogen peroxide are added.

Simple Method for Staining Spirochetes.—A new method for staining of spirochetes has been devised by Weiss. The material supposedly containing spirochetes is placed on a slide in a drop of 5 per cent glacial acetic acid. The slide is inverted over a hollow ground slide and placed in the incubator for fifteen minutes. The drop is then spread and allowed to dry in air. The slide is covered with the mordant and steamed for from two to five minutes. The slide is then washed with warm water and covered with a saturated solution of one of the recommended basic dyes for from two to five minutes; the slide is then washed with water and dried in the air. If a contrastive staining is desired, the slide is then covered with a 10 per cent solution of contrasting acid dye in 30 per cent alcohol for from eight to ten minutes, washed with water and dried.

Journal of Pharmacol. & Exper. Therap., Baltimore

37: 1-120 (Sept.) 1929

Alleged Antidotal Action of Sodium Thiosulphate in Mercuric Chloride Poisoning. K. I. Melville and M. Bruger, Montreal.—p. 1.
Narcosis of Muscle by Gases. H. T. Graham, St. Louis.—p. 9.
Acquisition by Isolated Muscle of Tolerance to Narcotics. H. T. Graham, St. Louis.—p. 35.
Lathyrism. R. Stockman, Glasgow.—p. 43.
Effect of Mercury on Intestinal Motility. W. Salant and K. Brodman, Augusta, Ga.—p. 55.
Mechanism of Digitalis-Emesis in Pigeons. P. J. Hanzlik and D. A. Wood, San Francisco.—p. 67.
Intestinal Activity in Unanesthetized Dogs as Influenced by Morphine and by Papaverine. C. M. Gruber and P. I. Robinson, St. Louis.—p. 101.

Medical J. & Record, New York

130: 301-360 (Sept. 18) 1929

*Heliotherapy and Pulmonary Tuberculosis. F. Eberson, San Francisco.—p. 301.
Factors to Be Considered in Treatment of Colds. W. Wolf, New York.—p. 308.
Pseudoleukemia. G. T. Harding, III, and L. H. Van Buskirk, Columbus, Ohio.—p. 310.
Arterial Hypertension. W. E. Fitch, Bedford Springs, Pa.—p. 312.
Sedimentation Test in Gynecology: 150 Cases. H. H. Johnson and J. S. Diasio, New York.—p. 316.
Prognosis of Malignant Tumors. W. C. Hueper, Chicago.—p. 318.
Early Tuberculosis in Child. J. J. Goldstein, New York.—p. 322.
Intestinal Stasis. W. A. Lane, London.—p. 323.
Colopathies. A. Bassler, New York.—p. 325.
Duodenal Tube as Help in Treatment of Postoperative Acute Gastric Ileus After Gastro-Enterostomy. M. Einhorn, New York.—p. 327.
Dependable Methods of Producing and Maintaining an Aciduric Intestinal Flora. J. H. Kellogg, Battle Creek, Mich.—p. 329.
*Carrier for Barium in Roentgenology. J. A. Tobey, New York.—p. 332.
Rectovaginal Fistula: Case. J. F. Saphir, New York.—p. 333.
Large Diverticulum of Duodenum with Concretion Lodged for Two Years and Expulsion of Latter During Routine Roentgenographic Gastro-Intestinal Examination: Case. I. Glassman, New York.—p. 334.
Therapeutic Uses of Radium Emanation: IV. Treatment of Rectal Cancer. J. Muir, New York.—p. 339.

Heliotherapy and Pulmonary Tuberculosis.—Eberson warns that sun treatment is not a cure-all, but it is a valuable method of treatment. Indiscriminate sunning should be discouraged and forbidden. Unsystematic and overdosed sunbaths must not be confused with sun treatment in tuberculosis. Heliotherapy can be controlled and tolerance toward treatment accurately followed by studying temperature reactions before insolation, immediately afterward, and from half an hour to an hour later. The clinical symptoms and signs attending excessive sun treatment should serve as warnings of the patient's poor response to heliotherapy. Overfatigue, headache, nausea or gastro-intestinal disturbances warrant immediate cessation of treatment and its resumption at a lower level of intensity. Pigmentation of the skin can be used as a guide in sun exposure, and burning is to be carefully avoided if the requisite tanning effect is not to be delayed or entirely prevented. In blond patients and others whose skin burns readily, a temporary carotinemia produced by a diet of carrots and spinach will favor deposition of pigment under the skin, and the acquisition of a coat of tan. Heliotherapy has a definitely established place in the treatment not only of extrapulmonary but also of pulmonary tuberculosis. A pulmonary infection is not a contraindication to sun treatment even in moderately or far advanced cases. With the exercise of caution and gradual exposure until the region of the chest is reached, good results can be insured and symptoms and signs ameliorated or dissipated entirely. Sun treatment should be interdicted when hectic fever and toxemia are present. Fluctuations in temperature serve as criteria and give warning that the treatment is being tolerated badly or not at all. Pulmonary tuberculosis of children can be treated satisfactorily by heliotherapy. Heliotherapy should always be combined with absolute rest and quiet during the treatment. Insolation without rest has little or no value, particularly in the treatment of juvenile tuberculosis.

Carrier for Barium in Roentgenology.—According to Tobey, the carrier for barium sulphate which seems to come nearest to fulfilment of the standards, except in cases of diabetes, is chocolate malted milk. Strict accuracy in measuring is not essential in making up a barium meal. Excellent results seem to be obtained by using one-third barium sulphate and two-thirds chocolate malted milk powder. The easiest procedure is to fill a large glass jar, such as a soda fountain jar, approximately one-third full of the pure barium sulphate and then add the chocolate malted milk to it and mix thoroughly. Thus, the powdered material is ready in bulk, instead of having to be prepared for each individual case. When one is ready for a study meal, this powdered mixture of barium sulphate and chocolate malted milk should be liquefied by adding it to water or fluid milk. Since about a pint of this solution may be given as the meal, four or five teaspoonfuls of the powder may be added to 16 ounces (one pint) of water. If whole fluid milk is used in place of water, as may be allowable in the case of many patients, somewhat less of the chocolate malted milk and barium powder is sufficient. The whole liquid mixture should be vigorously stirred, preferably with a mechanical mixer. For an individual meal, from 2 to 4 ounces of barium sulphate may be added to from 12 to 16 ounces of reliquefied chocolate malted milk, about 4 teaspoonfuls of the chocolate malted milk powder to 12 ounces of water. As before, the final mixtures should be well stirred. The customary technic in roentgenology of the gastro-intestinal tract is to give the study meal and nothing else in the morning, either rather early, as at 6 a. m., or at the regular breakfast time. From four to six hours later the examination may be made, either by fluoroscopy or by plates or by both, the last method being generally desirable in the study of the gastro-intestinal tract. A second study meal may be given at this time, if desired.

New England J. of Medicine, Boston

201: 503-554 (Sept. 12) 1929

Medical Cooperation in Management of Surgical Case. W. Mason, Fall River, Mass.—p. 503.
Choice of Anesthesia. L. F. Sise and P. D. Woodbridge, Boston.—p. 506.
Postoperative Treatment. E. H. Pool, New York.—p. 510.
Cystic Artery in Cholecystectomy. F. H. Lahey, Boston.—p. 522.
Uterine Bleeding: Analysis of Cases Seen in Tumor Clinic of Massachusetts General Hospital. J. V. Meigs, Boston.—p. 525.
Multiple Sclerosis: Pitfall in Diagnosis. M. Fremont-Smith, Boston.—p. 531.

201: 555-610 (Sept. 19) 1929

Ovarian Tumors in Childhood: Five Cases. T. H. Lanman, Boston.—p. 555.
Experiences with Spinal Anesthesia in Genito-Urinary Surgery. R. C. Graves and J. L. Doherty, Boston.—p. 563.
*End-Results of Operations for Nephroptosis and Aberrant Renal Vessels. E. L. Peirson, Jr., and J. D. Barney, Salem, Mass.—p. 568.
Position in Treatment of Fracture of Carpal Scaphoid. D. Berlin, Boston.—p. 574.
Creeping Eruption (Larva Migrans): Case. J. L. Grund, Boston.—p. 579.
Carbon Monoxide Poisoning. D. C. Dow, Cambridge, Mass.—p. 583.
Chart to Estimate Percentage Change. F. C. Forsbeck, Boston.—p. 586.

End-Results of Operations for Nephroptosis and Aberrant Renal Vessels.—Peirson and Barney assert that nephropexy is technically excellent but in their hands has often failed to give satisfactory results. They believe that the operation should be performed only after an exhaustive study of the case has ruled out all other causes of symptoms and after a complete urologic examination has been made with a pyeloureterogram, with the patient in the upright posture. If there is definite hydronephrosis with kinking of the ureter, or a suggestion of an aberrant vessel obstructing the ureter, they advise operation without any preliminary treatment. In the absence of these conditions they believe that the patient should first have orthopedic and medical treatment, and that operation should be advised only after failure of these measures. In general, the operation is more successful when there is hydronephrosis and kinking of the ureter. Likewise, it is more successful in men than in women, on the right side more than on the left, and when there has been a history of severe pain and the patient is one of average weight. Any pyelitis present frequently clears up after operation. Failures in a great majority of cases can be traced to general abdominal ptosis and neurosis. This condition should have careful attention. A well fitted abdominal belt generally gives relief to patients who have not been cured by the operation. Excellent results are obtained when there is an aberrant vessel obstructing the ureter by simply cutting the vessel and suspending the kidney if the ureter is redundant.

New York State J. of Medicine, New York

29: 1113-1176 (Sept. 15) 1929

Trichinosis. M. Weiss, Binghamton.—p. 1113.
Cancer Situation in State of New York: V. Cancer Clinic. J. M. Swan, Rochester.—p. 1117.
Practical Epidemiology. F. W. Laidlaw, Middletown.—p. 1118.
County Health Department in Operation. A. T. Davis, Riverhead.—p. 1120.
Diagnostic Value of Latent Jaundice in Abdominal Affections. H. A. Rafsky, New York.—p. 1123.
Allergic Diseases in Childhood. T. W. Clarke, Utica.—p. 1126.
*Stricture of Male Urethra: Prognosis Based on Study of 1,244 Cases. M. F. Campbell, New York.—p. 1135.
Present Trends in Treatment of Peptic Ulcer. H. F. Shattuck, New York.—p. 1138.
Health Examination: Fundamental Considerations. C. W. Crampton, New York.—p. 1141.
Respect Your Physician. L. G. Kerr, New York.—p. 1144.
*Poppis: Code Word for Approach to Diagnosis in Childhood. J. Sobel, New York.—p. 1146.

Stricture of Male Urethra.—According to Campbell, the prognosis of stricture is in direct ratio to the severity of the inflammatory scar and to the thoroughness of treatment. The intelligent use of steel sounds will cure a few cases and control all. Operative procedures are required in the presence of periurethral infection, impassable strictures or those which do not respond properly to sounds. It should be forcibly impressed on the mind of the posturethrotomy patient that the operation is not the end but only a step in the progression to a cure. Urethral dilation must be started soon after operation and carried on until such time as the urethra will remain dilated. It is important even then that sounds be passed two or three times a year. Of patients in whom this schedule is not followed, a third will require reoperation; a fourth of this number will require reoperation within ten years. In considering the prognosis in a given case, the renal function and presence or absence of renal complications always merit most serious consideration since renal function is the thread by which the life of the patient hangs.

Poppis: Code Word for Approach to Diagnosis in Childhood.—The individual letters in this code word, used by Sobel, are intended to direct attention to various diseases to which children are specially susceptible, as pharyngitis, otitis, pneumonia, pleurisy and pericarditis particularly, and to pertussis, and with them other allied intrathoracic conditions—endocarditis, enlarged thymus, tracheobronchial adenitis, tuberculosis, empyema, atelectasis, pyelitis, poliomyelitis and poliencephalitis, pyloric stenosis or pylorospasm, intussusception, syphilis, sepsis, spasmophilia and scurvy. Sobel also adopted a coined code word known as haasim as a lead to the diagnosis of certain conditions peculiar or common in the new-born, hemorrhagic diseases of the new-born, asphyxia, atelectasis, sepsis and syphilis, inanition, icterus and infections, mastitis and meningitides.

Northwest Medicine, Seattle

28: 391-438 (Sept.) 1929

*Hyperthyroidism Complicating Pregnancy. F. H. Falls, Chicago.—p. 391.
Substernal Thyroma. W. J. Slater, Portland, Ore.—p. 395.
*Menstruating Tract from Uterus to Anterior Abdominal Wall: Case. G. C. Schauffler, Portland, Ore.—p. 399.
Use of Foreign Proteins in Treatment of General and Ocular Inflammations. J. M. Patton, Omaha.—p. 405.
Malignancy of Gastro-Intestinal Tract. W. F. Hollenbeck, Portland, Ore.—p. 408.
Carcinomatous Gastric Ulcer. W. H. Bueermann, Portland, Ore.—p. 412.
Mortality of Appendicitis in Children. H. E. Coe, Seattle.—p. 416.
Care of Acute Otitis Media. I. E. Gaston, Portland, Ore.—p. 419.
Hematemesis. T. T. Manzer, Seattle.—p. 423.
Primary Inguinal Hernia with Strangulation. L. A. Steeves, Salem, Ore.—p. 425.
Our State Organizations. J. G. Crownhart, Madison, Wis.—p. 426.

Hyperthyroidism Complicating Pregnancy.—Falls points out that the pregnant state may be complicated by mild hyperthyroidism, exophthalmic goiter and toxic adenoma, or by patients who have been operated on previously for toxic goiter. Those cases showing mild hyperthyroidism may be regarded as

physiologic and no special treatment is advised except compound solution of iodine, five drops three times a day, and careful supervision for further evidences of thyrotoxicosis. Patients with hyperemesis gravidarum should be carefully examined for evidences of hyperthyroidism. Exophthalmic goiter and toxic adenomas complicating pregnancy should be treated conservatively until the viability of the baby or at least until the medical treatment has demonstrated its own failure. Toxic adenomas may have to be operated on because of pressure symptoms or because of failure to respond favorably to compound solution of iodine. Patients responding well to medical management may be allowed to go to term and deliver spontaneously or with slight assistance.

Menstruating Tract from Uterus to Anterior Abdominal Wall.—From the observations in his case, Schauffler is convinced that direct invasion of the abdominal scar by endometrial elements by way of nonabsorbable suture tracts or sinuses, dependent on pressure or infection necrosis or drains, is the correct explanation of the occurrence of many of these growths. It cannot, however, explain all the reported cases.

Oklahoma State M. Assn. Journal, Muskogee

22: 309-342 (Sept.) 1929

Respiratory Infections in Children. C. M. Pounders, Oklahoma City.—p. 309.
Tuberculosis in Children. C. Puckett, Oklahoma City.—p. 312.
Hypertrophic Stenosis of Pylorus. H. Reed, Oklahoma City.—p. 314.
Diagnosis of Foreign Bodies in Air and Food Passages. L. C. McHenry, Oklahoma City.—p. 317.
Importance of Endocrinology in Pediatrics. H. H. Turner, Oklahoma City.—p. 319.
Health Examination: Infant and Preschool Child. L. S. Blachly, Oklahoma City.—p. 323.
Child Dental Conditions and Profession's Responsibility. M. C. Howard, Oklahoma City.—p. 328.
Infantile Eczema. C. P. Bondurant, Oklahoma City.—p. 333.

Philippine J. of Science, Manila

40: 1-131 (Sept.) 1929

Mayon Volcano and Eruptions. L. A. Faustino.—p. 1.
Duration of Immunity to Yaws in Philippine Monkeys. B. Tanabe.—p. 49.
Serologic Studies in Experimental Yaws. O. Schöbl.—p. 53.
Experiments Concerning Yaws Antigen Which Produces Positive Wassermann Reaction When Injected in Suitable Experimental Animals. O. Schöbl and B. Tanabe.—p. 57.
Is Wassermann Reaction Provoked in Philippine Monkeys by Yaws Vaccination Specific? I. Miyao.—p. 71.
Following Subcutaneous Immunization with Yaws Vaccine Is Skin Tissue Proper Responsible for Production of Wassermann Reagin or Do Other Tissues Also Participate? I. Miyao.—p. 75.
Relation of Wassermann and Kahn Reactions with Regard to Treponema Antigen. O. Garcia.—p. 79.
Summary of Serologic Studies in Experimental Yaws. O. Schöbl.—p. 89.
Immunologic Relation Between Yaws and Syphilis. O. Schöbl and I. Miyao.—p. 91
New Archipelagic Membracidae. W. D. Funkhouser.—p. 111.

Rhode Island M. Journal, Providence

12: 133-148 (Sept.) 1929

Significance of Hemolytic Streptococcus in Throats of Hospital Patients. D. L. Richardson, Providence.—p. 133.
Cancer Research Past and Present. H. C. Pitts, Providence.—p. 139.
Double Fecal Fistula of Six Years' Duration with Complete Cure. P. S. Dukakis, Boston.—p. 144.

Virginia M. Monthly, Richmond

56: 353-428 (Sept.) 1929

Vertex Presentation with Occiput Posterior: Most Frequent Cause of Intervention in Labor. P. Willson, Washington, D. C.—p. 353.
Use of Ophthalmoscope by General Practitioner. C. M. Miller, Richmond.—p. 361.
Sophism in Dermatology. W. J. Highman, New York.—p. 363.
Abdominal Hemorrhage of Ovarian Origin: Case. B. F. Eckles, Galax.—p. 371.
Diagnosis and Treatment of Sterility. I. Procter, Raleigh, N. C.—p. 373.
Diagnosis and Normal Delivery. H. J. Langston, Danville.—p. 379.
How May We Improve Our Obstetric Mortality? G. Baughman, Richmond.—p. 382.
Use of Clinical Laboratory by General Practitioner. A. F. Robertson, Jr., Staunton.—p. 384.
Treatment of Bronchial Asthma. T. S. Shelton, Richmond.—p. 385.
Rabies: Case. I. K. Redd, Atlee.—p. 388.
Rural Internship. D. B. Stuart, Dublin.—p. 390.
Surgery of Gallbladder. H. C. Jones, Petersburg.—p. 392.
Management of Pulmonary Tuberculosis. F. F. Oast, Roanoke.—p. 396.
Newer Conceptions of Mastoiditis. G. B. Trible, Washington, D. C.—p. 397.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British J. of Actinotherapy, London

4: 113-132 (Sept.) 1929

Actinic Treatment of Skin Diseases. H. C. Semon.—p. 116.
*Rôle of Spa in Treatment of High Blood Pressure. H. E. Rhodes.—p. 119.
Use of Silver Nitrate with U-V Light. L. Shillito.—p. 122.
U-V Light and Radiant Heat in Treatment of Finger Injuries. I. H. L. Williams.—p. 123.
Medical Review of British Spas: III. Harrogate. M. B. Ray.—p. 124.

Rôle of Spa in Treatment of High Blood Pressure.—Rhodes stresses the fact that spas cannot permanently cure high blood pressures, but that they have the means of breaking vicious circles and getting the patient into good working order again. The patient, removed from business and domestic worries, is amid fresh surroundings and has time for suitable recreations and exercise. Daily attendance at the baths and regular visits to the physician prescribing treatment give him the impression that something is really being done for him and thereby encourages a hopeful outlook, of great assistance to recovery. Patients will readily assent to dieting, will retire early to bed, and carry out other instructions which they would not tolerate at home.

British J. of Radiology, London

2: 371-418 (Aug.) 1929

True Absorption of Energy of Electromagnetic Radiations in Light Substances. W. V. Mayneord.—p. 373.
Radium and Radon Tubes: Minimum Intensities for Practical Use. S. Russ and G. M. Scott.—p. 390.
Source of Error in Measurement of Dosage. A. E. Barclay, G. Stead and S. F. Cox.—p. 401.

British M. Journal, London

2: 443-482 (Sept. 7) 1929

Distribution and Nature of Food Poisoning. J. Cruickshank.—p. 443.
Present Position of Voluntary Boarder. H. Yellowlees.—p. 446.
Roentgen Treatment of Wounds. L. Freund.—p. 449.
Causes and Treatment of Persistent Nasal Catarrh, Particularly in Children. D. McKenzie.—p. 450.
*Incidence of Tuberculous Infection in Milk Supplies of Scottish Cities. N. C. Wright.—p. 452.
Radium Climacteric. P. C. Fenwick.—p. 455.
Epinephrine Pack in Treatment of Glaucoma. R. E. Wright and K. K. Nayar.—p. 456.
*Acetic Anhydride Test of Spinal Fluid. G. L. Piotrowski.—p. 457.
Abdominal Torsion of Omentum. J. M. Black.—p. 458.
Gravitational Massage. A. G. MacKenzie.—p. 458.

Incidence of Tuberculous Infection in Milk Supplies of Scottish Cities.—Examining samples of mixed (raw) milk taken from bulk on arrival by transport from country sources, Wright found the incidence of infection with tubercle bacillus to be: Edinburgh, 8.5 per cent; Glasgow, 2.6 per cent, and Aberdeen, 5.5 per cent. It is an established fact that a considerable proportion of cases of abdominal tuberculosis is due to infection of bovine origin, and it is assumed that such infection is, in a number of cases, caused by the consumption of tuberculous milk. If tuberculous milk is, in fact, a frequent cause of infection, one should expect that the differences in the incidence of tuberculous milk in each of the three cities would be reflected in the mortality from abdominal tuberculosis. As a matter of fact, while there was a slight variation in the death rate between the cities during the earlier years, the death rates during the last eight or nine years have been practically identical, although these were the years during which large variations were found in the incidence of infection of the city milk supplies. A check was made of the deaths of abdominal tuberculosis in children under the age of 5 years, since this should give a more accurate estimate of milk-borne infection. There was again found to be no considerable difference between the death rates of these cities. If the occurrence of abdominal tuberculosis provides an indication of the relative cleanliness of the milk supply, it appears that the occurrence of living tubercle bacilli in the milk as delivered to the public is the same for each of the three cities investigated.

Acetic Anhydride Test of Spinal Fluid.—Piotrowski has investigated the acetic anhydride test in eighty-eight cases: paresis, ten cases, six positive; tabes, five cases, all negative;

tuberculous meningitis, six cases, four positive; staphylococcal meningitis, one case, strongly positive; two other cases of meningitis, positive; in syphilitic meningitis and cerebral syphilis, the cerebrospinal fluid was normal; in two other cases the test was doubtful; congenital syphilis, two cases, negative; meningeal hemorrhage, four cases, negative; cerebral degeneration, ten cases, seven positive; cerebral tumors, always negative; epidemic encephalitis, five cases, negative; zona, three cases, negative; poliomyelitis, two cases, slightly positive. In twenty other cases there were nine of meningism (fracture of the skull, headache, neurasthenia, hysteria). In five a weakly positive reaction was found, although there was no question of cerebral degeneration or of syphilis.

Glasgow Medical Journal

31: 121-176 (Sept.) 1929

Cerebrospinal Circulation. A. Young.—p. 121.
*Early Stages of Oral Cancer. G. T. Mowat.—p. 144.

Early Stages of Oral Cancer.—In a series of 244 cases of oral cancer analyzed by Mowat, the large majority showed a long period of chronic irritation of the part affected, which could have been avoided and the onset of the epithelioma probably averted by removal of the irritant at an early stage.

Journal of Mental Science, London

75: 357-572 (July) 1929

Psychiatric Use of Methods and Results of Experimental Psychology. C. E. Spearman.—p. 357.
Excitation Processes of Conscious and Subconscious Mind. W. Burridge.—p. 371.
Excitation Processes of Fits and Other Convulsive and Emotional States. W. Burridge.—p. 395.
Significance of Double Nerve Supplies. W. Burridge.—p. 404.
Law and Certifying Practitioners. Lord Sandhurst.—p. 406.
*Light Therapy in Mental Hospitals. H. D. Cormac.—p. 410.
*Urinary Reactions in Relation to Intestinal Toxemia in Psychotic Subjects. S. A. Mann and H. L. Shipp.—p. 420.
Concept of Ego in Psychiatry; Psychoanalysis. J. E. Nicole.—p. 427.
Psychoanalytic Principles and Society. F. J. Farnell.—p. 440.
Readjustive Process in Neurotic Reaction-Types. W. McC. Harrowes.—p. 449.
*Dermographia in Insane. A. W. H. Smith.—p. 458.
Relation of Focal Infection to Mental Diseases. W. Hunter.—p. 464.
Nerves and City Civilization. P. Gibbs.—p. 467.

Light Therapy in Mental Hospitals.—Actinotherapy, in Cormac's experience, is a necessary adjunct to the treatment of mental cases. It is employed by him as a routine for convalescent patients, whose recovery is thereby hastened. Care is necessary in the choice of cases for treatment, the type who benefit to the greatest degree having already been indicated. Mention should, however, be made of the excellent results obtained in dementia praecox of the simple type, and also in hebephrenia after the acute phase has passed. It is Cormac's opinion that every psychopathic hospital should be equipped with ultraviolet ray apparatus for the treatment of mental disorders, as well as for the many physical diseases that are ameliorated by its use. Opportunity would also be given for more extensive study of this subject, which would give scope for wider research into its physiologic relation to the psychoses and the nervous system generally.

Urinary Reactions in Relation to Intestinal Toxemia in Psychotic Subjects.—Mann and Shipp have found that the Euscaino black reaction in the urine is associated merely with the concentration of normal urinary constituents, and conclusions based on the incidence of this reaction in the urine of psychotic subjects with regard to the existence of toxic substances or the possible influence of intestinal toxemia are utterly fallacious. The same applies to the value of crude tests on untreated urines, such as the simple addition of Millon reagent. The technic attached to such investigations presents extreme difficulty and the cases under examination should be rigorously controlled as regards diet and time of collection of specimens. No simple tests of the urine are of any value, and all investigations should be on the scheme elaborated by Stewart, with chemical and numerous normal controls. The evidence so far available does not warrant the assumption, based on urinary reactions, that the presence of bodies arising from protein putrefaction has any peculiar significance in psychotic subjects. If this is the case it is necessary to assume the presence of some hitherto undiscovered toxic substance arising from intestinal toxemia, or to assume that the psychotic organism is more prone to be affected by putrefactive products than is the normal organism.

Dermographia in Insane.—An examination of 811 mental patients has convinced Smith that dementia praecox is the only class of insanity which shows a percentage of dermographia sufficiently in excess of the average to warrant its being claimed as a characteristic phenomenon, but the total percentage is even then so small as to preclude any suggestion of its being pathognomonic. While dementia praecox is said to be the commonest form of insanity to show dermographia, the most conspicuous examples are to be found in other classes, so that in any individual case the symptom cannot be regarded as diagnostic in any more than a relative sense and of proportional valuation.

Lancet, London

2: 483-534 (Sept. 7) 1929

*Relationship of Dermatology to Other Branches of Medicine. H. W. Barber.—p. 483.
*Histology of Carcinoma of Breast. D. H. Patey and R. W. Scarff.—p. 492.
*Occupational Diseases of Hop Picking. B. M. Smithies.—p. 494.
Spontaneous Reduction in Volvulus of Bowel: Three Cases. R. C. McWatters.—p. 496.
Epidemic (Lethargic) Encephalitis in Infant Aged 14 Days. A. Moncrieff.—p. 496.
Continuous Artificial Respiration. J. B. Oldham.—p. 497.

Relationship of Dermatology to Other Branches of Medicine.—Barber asserts that one may justifiably compare tuberculosis, syphilis and rheumatism. There is increasing evidence that rheumatic fever and some of the chronic forms of rheumatic disease are due to streptococcal infection. Certain cutaneous manifestations of these three infections and of the severer forms of ringworm are comparable and sometimes indistinguishable, and depend on an allergic condition of the skin. This allergic condition of the skin is to some extent a protective mechanism against involvement of more vital organs. Interference with the normal physiologic functions of the skin, such as is bound to occur in the majority of persons living under civilized conditions, is an important factor in predisposing to active infection with certain organisms, such as the tubercle bacillus, and with the common saprophytes of the mucous membranes and skin.

Histology of Carcinoma of Breast.—One hundred and ten carcinomas of the breast with their secondary deposits in the axillary glands, and fifty-three cases without secondary deposits, have been examined by Patey and Scarff from the point of view of the histologic appearances of malignancy. In the large majority of instances (83 per cent) the secondary deposits in the lymphatic glands are similar in appearance and malignancy to the primary growth; in an appreciable minority (16 per cent) the malignancy of the glandular metastases is lowered, but only in one case is the malignancy raised. The series of cases in which secondary deposits have not been found in the axillary glands shows a relatively much greater number of tumors of low histologic malignancy than does the series with such deposits.

Occupational Diseases of Hop Picking.—There are three recognized conditions due to hop picking, and seen only among hop pickers. These are known as "hop rash," "hop eye" and "hop gout," and are familiar to those who have worked in and among hop gardens. Smithies relates her experience as medical officer to the Hop Pickers' Hospital and Dispensaries at Marden in 1927.

Bulletin de la Soc. d'Obst. et de Gynéc., Paris

18: 395-445 (June) 1929

Cancer of Vaginal Scars of Total Hysterectomy. Hartmann, Fabre and Dubois-Roquebert.—p. 395.
Myomectomy Followed by Two Normal Labors. L. Bazy and Hidden.—p. 395.
*Ectopic Gestation Carried to Term. Portes, Desnoyers and Leblanc.—p. 396.
Obstetric History in Patient with Double Uterus. A. Grosse.—p. 399.
*Tuberculous Meningitis in Pregnancy. A. Grosse.—p. 400.
*Rupture of Uterus. A. Grosse.—p. 402.

Ectopic Gestation Carried to Term.—The case reported by Portes et al concerns a woman, aged 28, pregnant for the second time. The entire period of gestation was characterized

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by the weekly occurrence of violent pain which forced the patient to remain in bed for two or three days but was not followed by metrorrhagia. At the beginning of the ninth month the pain was unusually severe and was accompanied by metrorrhagia, after which the patient no longer felt fetal movements. Nothing further having occurred two months later, she came to the clinic for examination. Roentgenograms did not show the exact position of the fetus, which was found at laparotomy in a cyst to the left of the uterus.

Tuberculous Meningitis in Pregnancy.—The patient, according to Grosse, did not present signs of pulmonary involvement, but some months previously she had nursed a brother who died of acute phthisis. Symptoms of tuberculous meningitis being evident at the end of pregnancy, labor was induced in the attempt to save the child. The mother died several hours later. The child is now 7 years of age and is healthy.

Rupture of Uterus.—Grosse stresses the importance of treating all patients with dystocia in a hospital. In the case he reports, a rupture of the uterus during the extraction of a dead fetus necessitated subtotal hysterectomy. The patient recovered, in spite of the fact that she had not been brought to the clinic until twelve hours after the accident and had symptoms of beginning peritonitis. The author feels that, if the patient had been under observation, a timely operation might have saved the child.

Bulletins et Mém. de la Soc. des Chirurgiens de Paris

21: 505-544 (June 21) 1929

Typhlosigmoidostomy. J. Lanos.—p. 507.
Forage of Prostate. De Barros Coelho.—p. 509.
Isolated Tubercles on Mesenteric Lymph Nodes. Dervaux.—p. 510.
*Postoperative Toxemia: Unusual Symptoms (Lilliputian Hallucinations). M. Manon.—p. 513.
Congenital Dislocation of Hip Joint: Study of 100 Untreated Patients with Osseous Malformation. R. Soutter.—p. 515
Congenital Dislocation of Hip Joint: Operation for Defective Acetabulum. R. Soutter.—p. 519.
Colectomy in Case of Dolichocolon of Right Side: Colitis: Cancer of Small Intestine. Victor-Pauchet.—p. 528.
Spontaneous Fractures of Ribs: In One Case Followed by Cold Abscess Twelve Months Later. P. Séjournet.—p. 530.
Retro-Uterine Hematocele of Ovarian Origin. M. Haller.—p. 533.
Tuberculous Appendicitis. Muller.—p. 540.
Cancer of Stomach: Perigastric Abscess. Victor-Pauchet.—p. 544.

Postoperative Toxemia: Unusual Symptoms (Lilliputian Hallucinations).—Dufourmentel in a discussion of the case presented by Manon compares this type of hallucination to that caused by alcoholism. This symptom is agreeable for the patient and has also been observed in certain stages of inanition and at the beginning of epileptic convulsions. Manon's patient developed the symptoms on the sixth day following hysterectomy.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

53: 865-972 (July 8) 1929

Acute Lung Diseases in Adults: Spontaneous Recovery. E. Bernard.—p. 866.
Craniofacial Pseudo-Articulation. A. Léri and L. Lebourg.—p. 871.
Gunn's Syndrome: Congenital and Hereditary Form. A. Léri and J. Weill.—p. 875.
Pulmonary Suppuration During Influenza: Five Cases with Apparently Rapid Recovery. F. Bezançon, M. Chevalley and Oumansky.—p. 880.
*Renal Acidosis: Variations in Chloride and Sodium Contents of Blood. H. Bénard, J. Lenormand and F. P. Merklen.—p. 894.
*Subacute Myelitis in Adult: Belated Serotherapy. K. Étienne.—p. 902.
*Periodic Hydarthrosis: Cured by Ergotamine Tartrate. R. Weismann-Netter.—p. 909.
Chronic Deforming Rheumatism. M. P. Weil, R. Weismann-Netter and V. Oumansky.—p. 914.
Tumor in Rathke's Pouch with Pituitary Infantilism and Adiposogenital Syndrome. G. Guillain and J. Decourt.—p. 918.
*Brain Abscess Simulating Epidemic Encephalitis. G. Guillain, J. Périsson and I. Bertrand.—p. 922.
Extrarenal Factor in Diuretic Action of Organic Compounds of Mercury. Loeper and Duron.—p. 927.
Rôle of Chloride Ion in Hypertension and Azotemia. P. Merklen and J. Chaumeriac.—p. 934.
Generalized Atrophic Scleroderma of Tuberculous Origin with Ovaro-mammary Syndrome. F. Trémolières, J. Lhermitte, A. Tardieu and A. Carteaud.—p. 938.
*Acute Chorea: Cerebral Lesions. J. Lhermitte and P. Pagniez.—p. 945.
Suprarenal Tumor with Paroxysmal Hypertension. M. Labbé, Azérad and Violle.—p. 952.
Hypochloremia in Chronic Nephritis with Azotemia: Increase of Azotemia Following Medication. A. Lemierre, R. Thurel and M. Rudolf.—p. 956.

Renal Acidosis: Variations in Chloride and Sodium Contents of Blood.—In the study of twelve patients with renal acidosis, Bénard et al. found that in this condition the amounts of chloride and sodium in the blood vary greatly. They believe, therefore, that the disturbance of the acid-base balance is caused by organic substances and proteins.

Subacute Myelitis in Adult: Belated Serotherapy.—Étienne's patient, aged 54, developed a high temperature, a sensation of fatigue and slight headache. In spite of this he continued at his work. Gradually his condition became worse and pain appeared in his thigh and lumbar region. Four months after the onset of the disease he was forced to remain in bed following paralysis of the left leg. The next day the left arm and right leg were paralyzed and he remained in this condition up to his entrance to the clinic shortly after. The bladder did not function and catheterization was necessary. The Wassermann reaction was negative. The patient developed hemorrhagic diarrhea when treated with mercuric cyanide. Six months following the first manifestation of the disease, antipoliomyelitis serum was given daily by intramuscular injections. His condition showed marked improvement from day to day and he returned to his home within two weeks after the treatment was begun. Seen ten months later, he seemed normal and had resumed his work. Étienne stresses the value of the administration of antipoliomyelitis serum even in late stages of the disease in adults. The condition of muscular atrophy resulting from paralysis of long duration can be remedied only by suitable orthopedic treatment.

Periodic Hydarthrosis Treated by Ergotamine Tartrate.—Weismann-Netter reports a case of this condition occurring in a woman, aged 26, three months after appendectomy was performed, with a slight pulmonary complication on the right side following the operation. The hydarthrosis in the right knee was not accompanied by pain but the swelling hindered locomotion. The symptoms occurred in regular periods of seven days and lasted three days. Coincident with this condition, the right leg showed marked dystrophy. The basal metabolism of the patient was normal and all other examinations proved negative. The patient's husband had developed tuberculosis previous to the appearance of the hydarthrosis. Bacilli were not found. The tuberculin cutireaction was negative in the patient herself. Guinea-pig inoculation of the fluid from the knee joint proved negative. Medication with various drugs had no effect on the condition until subcutaneous injections of ergotamine tartrate were made. A violent reaction in the knee occurred. The following attacks of hydarthrosis were very painful, but on continuation of the injections the symptoms gradually diminished. The patient became pregnant eight months after recovery and subsequently gave birth to a healthy child.

Brain Abscess Simulating Epidemic Encephalitis.—In the case reported by Guillain et al. the patient had been hit over the head with a hammer two months previous to the onset of the symptoms. Examination of the fundus of the eye revealed considerable edema of the intra-ocular end of the optic nerve. The clear spinal fluid contained 0.56 Gm. of albumin per hundred cubic centimeters and 68 lymphocytes per cubic millimeter; this together with bradycardia, excessive loss of weight and hyperleukocytosis in the blood led to the diagnosis of a cerebral abscess rather than encephalitis. The patient died, however, before an operation could be performed. Necropsy revealed a large abscess of the right temporal lobe of the brain. Guillain et al. stress the importance of early recognition and speedy surgical intervention in cases of brain abscess. The difficulty of diagnosis is increased by the absence of fever in such cases as long as the meninges are not infected or suppuration of the ear and intracranial phlebitis have not occurred.

Acute Chorea.—An extensive histologic and bacteriologic study of the cerebral lesions found at the necropsy of a patient, aged 15, was made by Lhermitte and Pagniez. They distinguish two types of chorea: the one, based on encephalitis, caused by the virus of epidemic encephalitis or another pathogenic virus, and the other caused by degeneration of the brain substance, as in their patient. In their case inoculation of emulsions of the brain substance into various animals gave negative results.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

55: 841-883 (June 22) 1929

Congenital Dislocation of Hip Joint: Treatment. P. Mathieu.—p. 842.
Electrical Bistoury. P. Moure.—p. 843.
*Citrated Solution (Normet) in Treatment of Severe Hemorrhage and Conditions of Shock. Normet.—p. 848.
Extraction of Teeth During Acute Period in Apical Abscess. P. Brocq. —p. 853.
Arteriography. H. Gaudier.—p. 862.
*Roentgen Examination of Bile Ducts After Cholecystostomy or Choledochotomy, by Means of Injection of Iodized Oil. G. Cotte.—p. 863.
*Biliary Lithiasis: Surgical Intervention in Two Stages. G. Cotte.—p. 872.

Citrated Solution (Normet) in Treatment of Severe Hemorrhage and Conditions of Shock.—Normet considers his solution as being equivalent to blood transfusion and as supporting the action of the latter. Although the injection of his solution alone did not prolong the life of an animal on which venesection had frequently been performed, yet when combined with a blood transfusion a second animal recovered. The solution contains, sodium citrate, 22 Gm.; calcium citrate, 9.5 Gm.; magnesium citrate, 4.5 Gm.; manganese citrate, 0.2 Gm.; iron and ammonium citrate, 1 Gm.; distilled water, 1,000 Gm. For injection, 20 cc. of this solution should be added to 1 liter of physiologic solution of sodium chloride.

Roentgen Examination of Bile Ducts After Cholecystostomy or Choledochotomy, by Means of Injection of Iodized Oil.—On the basis of his experience with twenty patients, Cotte stresses the value of roentgen examination after operation and before removal of the drain. He states that in two of the cases postoperative roentgen examination revealed calculi that had been overlooked during the first operation.

Biliary Lithiasis: Surgical Intervention in Two Stages.—The results obtained by Cotte in six patients in whom retention of bile was associated with angiocholitis are reported. One patient died of peritonitis three weeks following the second operation but the other five recovered.

55: 885-929 (June 29) 1929

*Cardiospasm or Stricture of Esophagus: Transgastric Dilation of Cardia. M. Larget and J. P. Lamare.—p. 886.
*Strangulation of Appendix in a Paracecal Fossa. J. Murard.—p. 890.
Primary Suture of Flexor Tendons of Third, Fourth and Fifth Fingers in Palm of Hand. A. Fellasson.—p. 893.
Phonetic Results in 100 Patients Operated on for Cleft Palate. V. Veau and S. Borel.—p. 894.
Mucoid Cyst of Left Ovary with Intestinal Occlusion. P. Brocq and R. Gueullette.—p. 909.
Localized Tuberculosis: Surgery and Ultraviolet Irradiation in Treatment. B. Desplas, J. Meillère and G. Chevillon.—p. 912.

Cardiospasm or Stricture of Esophagus: Transgastric Dilation of Cardia.—Larget and Lamare report favorable results with this intervention in two cases. They consider their method of dilation of the cardia indicated even in cases of stricture.

Strangulation of Appendix in a Paracecal Fossa.—This occurrence is reported in two patients by Murard. In both, a girl aged 18 and a boy aged 9, the onset of the symptoms was similar, consisting of acute pain in the right side of the abdomen without a rise in temperature or vomiting. Further attacks of pain and a slight rise of temperature occurred, and appendectomy was performed on one patient. In the second patient, the boy, aged 9, the temperature had remained normal throughout, but vomiting and diarrhea developed with an increasing tenderness of the abdomen being evident. The appendix of both patients was slightly discolored and somewhat enlarged but otherwise presented no pathologic alteration.

55: 931-990 (July 6) 1929

Fracture of Malleolus with Fracture of Astragalus. Alglave.—p. 932.
Tumor of Intervertebral Disk Compressing Cauda Equina. Alajouanine and Petit-Dutaillis.—p. 937.
Brain Abscess Caused by Trauma: Delayed Manifestation. A. Guillemin. —p. 945.
Egyptian Splenomegaly. P. Petridis.—p. 949.
*Splenectomy in Splenomegaly. Brin.—p. 963.
Enchondroma of Distal End of Femur. Brin.—p. 965.
*Chronic Recurrent Purpura Haemorrhagica. R. Grégoire.—p. 968.
Pseudotumors in Lateral Culdesacs After Removal of Uterine Adnexa. J. Fiolle, Hayem and Bourde.—p. 973.

Splenectomy in Splenomegaly.—Brin's patient, aged 57, was an alcohol addict. About eight years previously, however, she had stopped drinking because her appetite had become poor and her strength had decreased. After several severe attacks of vomiting of blood occurring two years previously, her condition became critical and she entered the clinic. The spleen was greatly enlarged and painful on pressure; the liver was but slightly enlarged and ascites was present. A blood count showed 3,100,000 erythrocytes and 3,100 leukocytes with 69 per cent polymorphonuclears, 25 mononuclears, from 4 to 5 large mononuclears and 1.5 eosinophils. The blood coagulation time was reduced. Neither glycosuria nor albuminuria was present. Subcutaneous injections of dextrose solution were made and 4 Gm. of calcium chloride was administered by mouth for two days before laparotomy was performed. When the peritoneum was incised a large amount of ascitic fluid escaped. The spleen was covered with white areas of perisplenitis and was greatly enlarged. The removal of the spleen was difficult because of adhesions at its upper pole. The patient recovered within a few weeks, however, and seventeen months after the operation was in good health, enjoying her meals and able to work all day. The blood count now is 5,611,000 erythrocytes and 12,000 leukocytes with 63 per cent polymorphonuclear neutrophils, 1 eosinophil, 33 lymphocytes and 3 monocytes.

Chronic Recurrent Hemorrhagic Purpura.—Grégoire reports the histories of three patients presenting symptoms of this disease. In all of them the tourniquet or capillary resistance test was positive. After splenectomy the condition improved, a slight capillary disturbance persisting in one patient only.

Paris Médical

2: 129-144 (Aug. 10) 1929

*Supra-Orbital Reflex. Petzetakis.—p. 129.
Icterus. C. Dreyfus.—p. 135.
"Surgical" Extraction of Teeth. J. Lehmans.—p. 138.
Diathermy. Boutarel.—p. 140.

Supra-Orbital Reflex.—On the basis of a study of more than 140 cases, Petzetakis concludes that compression of any part of the trigeminal nerve produces a change in the heart rhythm, the respiration and the tonus of the blood vessels. For the demonstration of this reflex he recommends compression of the supra-orbital nerve at the supra-orbital notch in the frontal bone.

Presse Médicale, Paris

37: 989-1004 (July 31) 1929

*Joint Fixation in Ostearthritis. Tuffier.—p. 989.
Encephalitis Lethargica (Economo) and Epidemic Encephalomyelitis. R. Cruchet.—p. 990.

Joint Fixation in Ostearthritis.—Tuffier reports the results of treatment in ostearticular tuberculosis, applying in ten cases his method of surgical fixation of joints without incurring loss of bony substance by producing artificial ankylosis. Of four patients with involvement of the knee joint, resection was necessary later in three; in one patient the result was favorable seen over a period of four years. In four cases of sacroiliac involvement two were reported favorable; in one patient a roentgenogram taken two and one-fourth years later was satisfactory. Two operations for tibiotarsal tuberculosis were successful, although in one case furunculosis delayed recovery.

37: 1005-1020 (Aug. 3) 1929

*Anuria with Transitory Azotemia. E. Joltrain and Maurice-Lévy. —p. 1005.
*Puerperal Scarlet Fever. P. Baize and M. Mayer.—p. 1007.

Anuria with Transitory Azotemia.—Joltrain and Maurice-Lévy report two cases. The first patient, a woman, aged 71, developed anuria following digestive disturbances caused by partaking of a meal. The fourth day of sickness there was not any discomfort but the anuria was still present. Chemical examination revealed a urea content of 2.46 Gm. in the blood and of 7.88 Gm. in the urine withdrawn by catheter. The alkali reserve was lowered to 23.1. In spite of an intravenous injection of 500 cc. of hypertonic dextrose solution the condition did not improve. One week after the onset of the symptoms the urea in the blood rose to 3.80 Gm., symptoms of cardiac insufficiency developed and marked anemia was present. A blood transfusion was performed which resulted in an aggravation of the cardiac symptoms; the next day 500 cc. of urine was removed. A loud murmur was heard over the heart and the urea in the blood rose to 4.15 Gm. The alkali reserve was still

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low (25) in spite of the absence of signs of acidosis. The temperature was elevated and a slight focus of congestion was evident in the right apex. An intravenous injection of 250 cc. of hypertonic bicarbonate solution did not influence the condition to any extent. The patient presented periods of agitation followed by great lassitude. Cheyne-Stokes respiration was accentuated and arrhythmia persisted. However, the diuresis increased steadily, being maintained at 1,200 cc. The urea content of the urine was 19.14 Gm., pointing to an effort of the organism to combat the intoxication. After venesection another transfusion of 250 cc. was performed. Almost immediately a transformation in the patient's condition was evident and the improvement persisted. However, pus suddenly appeared in the urine, which contained a large number of colon bacilli. The pyelonephritis was accompanied by a rise in the temperature. Within a few days, however, these symptoms disappeared and the recovery was rapid from now on. In a second case, in which the disease ran a similar course, the rôle of infection in the etiology of the azotemia was more clearly evident. The patient had a diffuse phlegmon of the leg with high temperature. Following two blood transfusions the condition gradually improved, the anemia and azotemia disappeared and the patient recovered completely. In both cases examination of the kidneys did not reveal calculi and the careful study of their function after recovery proved them to be normal.

Puerperal Scarlet Fever.—On the basis of a personal study of six cases and a review of the medical literature on the subject, Baize and Mayer state that in the puerperium two forms of true scarlet fever may be observed, namely, the form that is the result of an intercurrent infection and the form that is the result of an endometritis. True scarlet fever should not be confused with the scarlatiniform puerperal erythemas from which it can be differentiated by biologic tests, particularly the Schulz-Charlton reaction.

37: 1021-1036 (Aug. 7) 1929

*Suprarenal Insufficiency. G. Maranon.—p. 1021.
Gastrorrhagia Due to Chronic Splenomegaly. C. Frugoni.—p. 1025.

Suprarenal Insufficiency.—Maranon reports 104 cases of Addison's disease, in fifteen of which necropsy was performed. He divides the accidents in suprarenal insufficiency into three groups as follows: digestive, psychopathic and meningitic. Clinical examination revealed a parallelism between the severity of the symptoms and the degree of hypoglycemia. The acidosis in Addison's disease is caused by a disturbance in the carbohydrate metabolism that is unlike the disturbance that occurs in diabetes.

Revue Française de Gynécologie et d'Obst., Paris

24: 273-336 (May) 1929

*Cancer of Cervix Following Subtotal Hysterectomy. G. Jeanneney.—p. 273.
*Justification for Delivery Under Spinal Anesthesia (Delmas). P. Balard and E. Lacquièze.—p. 283.
*Delivery by Delmas Method. J. L. Audebert and E. Estienny.—p. 297.
*Purulent Pericarditis Treated with Vaccine During Postabortal Septicemia. G. Dujol.—p. 300.
Fibroma of Uterus in Pregnancy: Spontaneous Delivery. E. Cambon and J. Dor.—p. 302.
*Tubal Pregnancy Carried to Term. Daléas and Marriq.—p. 306.

Cancer of Cervix Following Subtotal Hysterectomy.—Jeanneney discusses the origin of this occurrence. Certain cases may result from incomplete operation if the hysterectomy was performed for cancer of the corpus. Others may develop spontaneously. In every case the prognosis is serious; surgical intervention is difficult. From a review of the medical literature and from his own experience Jeanneney concludes that although the proportion of cases of cancer developing on the cervix is not influenced by the preceding hysterectomy and that therefore the indications for this operation may remain unchanged, in cases in which total hysterectomy is possible it is preferable to apply this method.

Justification for Delivery Under Spinal Anesthesia (Delmas).—Balard, in discussing the medical aspect, and Lacquièze the legal attitude toward inducing labor under spinal anesthesia, conclude that the Delmas method cannot be as yet applied in all cases for the sole purpose of suppressing pain in childbirth.

Delivery by Delmas Method.—Audebert and Estienny report two cases in which labor was induced under spinal anesthesia. In one patient a hemorrhage resulted which proved fatal. Added to their own experience and by reviewing the medical literature, Audebert and Estienny find three deaths in sixteen cases, a mortality of 18.7 per cent for the Delmas method.

Purulent Pericarditis Treated with Vaccine During Postabortal Septicemia.—Dujol reports a case of staphylococcus septicemia following an abortion, in which an enlargement of the heart was first observed when taking a roentgenogram of the lungs to determine the extent of bronchopneumonic foci. A pericardiac puncture disclosed a fluid containing pus and staphylococci. An autovaccine was prepared from this fluid and subcutaneous injections of it were made daily. The patient recovered and when seen six months later the shadow of the heart was almost normal. Auscultation gave negative results.

Tubal Pregnancy Carried to Term.—Daléas and Marriq decided on surgical intervention after making a diagnosis of placenta praevia in a 16 year old pregnant Indo-Chinese woman. At laparotomy the fetus was seen lying on a bilobed placenta in the abdominal cavity. After removal the wound was closed; vaginal examination revealed the decidua in the process of being expelled. Recovery from the operation was normal; both mother and child were in good condition.

Revue d'Orthopédie, etc., Paris

16: 297-383 (July) 1929

*Tuberculous Juxta-Articular Osteitis of Knee in Children. F. Pouzet.—p. 297.
Articular Fractures of Upper End of Tibia: Conservative Treatment. R. Hoffmann.—p. 313.
*Multiple Familial Osteogenic Exostoses. E. Brenckmann and F. Trentz.—p. 333.
Atrophy of Leg and Coxa Valga Following Acute Anterior Poliomyelitis. Oudard and Courtier.—p. 343.

Tuberculous Juxta-Articular Osteitis of Knee in Children.—Pouzet reports twenty-five cases that came under his observation. The tuberculous lesions were present on one end of the bone only and the involvement of the joint was secondary. This indicates the necessity for immobilization of the latter to insure recovery. The patients should be reexamined frequently, especially older children in whom new foci may develop. In three of twelve patients with lesions on the metaphysis, genu valgum or genu varum was observed. In five out of thirteen cases a lesion of the epiphysis was found to have produced marked atrophy of the bone leading to shortening of the femur. The cartilage proximal to the tuberculous lesion produces less bone, whereas on the opposite side the normal growth continues and ossification takes place, thus giving rise to the deformities. Surgical intervention depends on the age of the patient, the site and extent of the lesion and the degree to which the joint is involved.

Multiple Familial Osteogenic Exostoses.—After discussing the etiology of this disease, Brenckmann and Trentz describe the occurrence of the symptoms in a woman, aged 24. Excessive growth necessitating surgical removal of an exostosis on the distal end of the femur took place following a trauma. Roentgen examination revealed many small typical exostoses on various other bones; the tumor of the femur, however, was characterized by a cauliflower-like appearance and the zone of calcification was irregular and especially evident toward the periphery. The center appeared of lighter hue and homogeneous. The basal metabolism of the patient was normal. The calcium content of the blood was at the lower level of the normal value, 0.088 Gm. per liter. Five months after resection of the tumor on the right femur, a recurrence of the growth was evident, as well as an enlargement of a second exostosis on the right tibia. Histologic examination of these did not reveal a malignant condition but showed the typical aspect of osteochondromas.

Revue Médicale de la Suisse Romande, Lausanne

49: 377-440 (June 25) 1929

*Pulmonary Tuberculosis: Pseudotuberculosis Caused by Infections of Upper Respiratory Tract. A. Dudan.—p. 377.
*Bile Secretive and Chromatogenous Function of Liver During Influenza. G. Albot and F. Barraud.—p. 411.
Antitetanic Serum: Comparison of French and Swiss Preparations. E. Urech.—p. 417.

Pulmonary Tuberculosis: Pseudotuberculosis Caused by Infections of Upper Respiratory Tract.—Dudan states, in an extensive clinical and statistical study of pulmonary tuberculosis, that at least 50 per cent of the patients said to be subject to this disease do not have it but are suffering from symptoms caused by infections of the upper respiratory tract. This pseudotuberculosis may originate from an anatomic abnormality in the nasal region causing chronic rhinitis or an allied condition. Dudan therefore stresses an adequate and more thorough examination of every patient suspected of being stricken with tuberculosis.

Bile Secretive and Chromatogenous Function of Liver During Influenza.—From a study of the secretion of bile in twelve patients, Albot and Barraud, using the method of Fiessinger and Walter, conclude that the secretion remains normal during influenza. In cases complicated by acute pulmonary suppuration, however, retention occurs, indicating the degree of hepatic anergy and thus the severity of the disease. This is also the case in pneumonia, erysipelas, scarlet fever and typhoid.

Schweizerische medizinische Wochenschrift, Basel

59: 757-780 (July 27) 1929

Pathogenesis, Diagnosis and Treatment of Appendicitis. P. F. Nigst.—p. 757.
*Prognosis in Operative and in Conservative Treatment of Fractures of Patella. C. Schlatter.—p. 761.
*Treatment of Exophthalmic Goiter. P. Bonem.—p. 764.
Diagnosis of Trachoma: Its Frequency in Different Countries. M. Levinson.—p. 765.
Morphology of Aerobic Actinomyces. J. Seitz.—p. 768.
Intermittent Colitis. A. Forel.—p. 770.
Total Anesthesia by Means of Intravenous Injection of Ethyl Alcohol. Gaudenz.—p. 770.

Prognosis in Operative and in Conservative Treatment of Fractures of Patella.—Schlatter reviews 122 cases of fractures of the patella. About 50 per cent of these patients had received surgical treatment while the others were treated conservatively. The records show that surgical treatment requires nearly twice as much time and costs twice as much as conservative treatment. However, it has to be taken into consideration that the patients who received surgical treatment were severely injured, whereas nearly all the patients who recovered without operation were not. The records also indicate that 75 per cent of the patients who underwent an operation received compensation, whereas of the patients who had been treated conservatively only 25 per cent were compensated. Nevertheless, the author thinks that, if a patellar fracture is complicated by tearing of the lateral ligaments, surgical treatment is necessary. In less severe cases, however, the prognosis will be more favorable, if the conservative methods are employed.

Treatment of Exophthalmic Goiter.—Bonem gives a summary of the various methods of treatment in exophthalmic goiter. He mentions the good results that are obtained with surgical treatment and he evaluates the various medicaments that may be employed. He also discusses hydrotherapy, dietary treatment, insulin injections, roentgen irradiation and the therapeutic influence of the low atmospheric pressure at high altitudes. An elevation of about 1,000 meters is considered the most advantageous. For patients for whom a sojourn in the mountains is not possible, treatment in low pressure chambers is recommended. The author also mentions the advantages and the disadvantages of medication with iodine. In order to determine the best treatment for the individual case of exophthalmic goiter, it is essential that the patient's basal metabolism be observed closely.

Archivio Italiano di Chirurgia, Bologna

23: 537-640 (May) 1929

Experimental Production of Bone by Injections of Calcium Salts. G. Annovazzi.—p. 537.
Study on Cysts of the Choledochus. L. di Natale.—p. 553.
Prostatectomy in Relation to Incapacitation from Work. V. Luccarelli.—p. 566.
Isolated Traumatic Lesion of Semilunar Bone. E. Benassi.—p. 577.
Experimental Reproduction of Acute Osteomyelitis with Filtrable Virus. O. Andrei.—p. 591.
*Results in Experimental Sympathectomy. F. Benso.—p. 593.
Technic of Cholecystectomy. G. Giuliani.—p. 603.
Clinicoroentgenologic Study on Diverticula of Duodenum. A. Anzilotti.—p. 613.

Results in Experimental Sympathectomy.—Benso states that his observations show that, when rigorous asepsis is employed and the least traumatism possible of the surrounding tissues is produced, the following histologic changes occur: (1) no reaction on the part of the intima; (2) replacement of the adventitia with elastic fibrous tissue, and (3) disseminated inflammatory foci here and there in the periadventitial tissue. Otherwise there occur in the intima and the media certain changes that may with reason be regarded as the cause for the failure of the sympathectomy.

Archivos de Cardiología y Hematología, Madrid

10: 209-240 (June) 1929

Neurogenic Hemorrhagic Syndromes. F. J. Ontiveros.—p. 209.
*Angina Pectoris: Danielopolu's Method of Suppression of Pressor Reflex (Sympathectomy). F. Duclos.—p. 224.
*Suture of Partially Torn Brachial Artery and Ligation of Completely Torn Brachial Vein. R. Diaz Sarasola.—p. 230.

Angina Pectoris: Danielopolu's Method of Suppression of Pressor Reflex (Sympathectomy).—Duclos' patient, aged 43, had attacks of angina pectoris, first at intervals of about a month and of about fifteen minutes' duration; then they became more and more frequent and finally they occurred almost every day. The attacks then lasted about half an hour and ended in a cold sweat. Inhalation of amyl nitrite during the attack lessened its intensity. Venesection also gave good results. The patient had a positive Wassermann reaction and had received treatment for syphilis. Her heart was normal. The attacks appeared independently of any effort or emotion. Medical treatment, a diet with a low nitrogen content, and rest in bed did not give relief. Sympathectomy gave good results. The patient has not had any attacks in the past three months. The author says that the paroxysmal forms of angina pectoris in which the pressor reflexes act on a coronary system which is not altered are the most appropriate forms for surgical intervention. In these cases the attacks are suppressed by sympathectomy. But the patients who have anatomic lesions of the coronary arteries or of the aorta do not receive any benefit from sympathectomy.

Suture of Partially Torn Brachial Artery and Ligation of Completely Torn Brachial Vein.—Diaz Sarasola's patient, aged 33, was wounded by a flying piece of steel, which lodged in the lower third of his left upper arm. When he removed his coat, the blood spurted from the wound. The wound was 5 mm. long and was situated at the internal border of the biceps at the level of the epicondyle. The lower third of the arm was inflamed but was not painful. The hand was normal in color and temperature. The radial pulse was imperceptible. A loud murmur over the brachial artery at the level of the wound was heard. Radioscopy showed the piece of steel embedded in the tissues. It was evident that the artery had been injured. Operation was performed. The foreign body could not be found. The brachial vein was completely torn and the brachial artery was partially torn. Proximal and distal ligation of the vein and end-to-end suture of the artery were done. The patient made a complete recovery.

10: 241-268 (July) 1929

*Endarteritis Obliterans of Posterior Tibial Artery. L. Calandre.—p. 241.
Glycemia in Experimental Trypanosomiasis of Guinea-Pigs. E. Angolotti and P. Carda.—p. 244.

Endarteritis Obliterans of Posterior Tibial Artery.—Calandre reports a case of endarteritis obliterans of the posterior tibial artery associated with incipient gangrene of the foot, in a man, aged 25. An arterioroentgenogram of the foot, made following an intra-arterial injection of sodium iodide, showed with perfect clearness the point of occlusion of the artery at the level of the inner malleolus. At the same time an abundant collateral circulation in the region of the heel was seen. A disarticulation of the foot was made. The surgical result was excellent.

Semana Médica, Buenos Aires

36: 1-60 (July 4) 1929

Delivery in Dystocia. T. A. Chamorro.—p. 6.
Scarlet Fever Toxin: Preparation and Use in Immunology. J. M. Miravent and E. Chiodi.—p. 9.
*Myocardial Infarct. D. Staffieri.—p. 20.
Surgery of Stomach as Practiced in Vienna. O. Copello.—p. 24.

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Treatment of Fractures of Forearm with Delbet's Splint. A. J. Costa. —p. 29.
*Bronchopneumonia in Adults: Vaccine Therapy. J. Kovatcheff.—p. 30.
Treatment of Toxic Amblyopia with Large Doses of Strychnine. A. Meerhoff and W. Meerhoff.—p. 55.

Myocardial Infarct. — Staffieri's patient, aged 38, while apparently in good health, had an attack of intense retrosternal pain, headache and dyspnea. The pulse was frequent and small and the patient was nauseated, vomited and coughed up blood. Injections of stimulants and other remedies failed. Venesection gave some relief. From the beginning of the disease oliguria, fever for about ten days and friction sounds over the pericardium were present. The patient could not sleep because of the pain and the dyspnea. Subcrepitant râles could be heard over both lungs. The electrocardiogram showed arrhythmia with ventricular extrasystoles which were repeated regularly after every other normal contraction. Absolute rest in bed for twenty days, small doses of digitalis, diuretics and a salt-free diet lowered the pulse rate (from 112 per minute to about 80), but did not produce a disappearance of the pain or an improvement in the general condition. When the patient was discharged, dyspnea and tachycardia appeared with the least effort. The extrasystoles had disappeared from the electrocardiogram. Twelve days later, however, the patient returned to the hospital with the same clinical picture he had had before. The same treatment gave similar results. The author feels that this is a case of myocardial infarct. He has seen several patients with this condition; some died suddenly during the acute attack; others became progressively worse and died weeks or months later, and still others showed a period of improvement (as in the case cited), then suddenly had a recurrence, and died with symptoms of acute cardiac insufficiency or cardiac shock.

Bronchopneumonia in Adults: Vaccine Therapy. — Kovatcheff used the vaccine of Weill and Dufourt in an epidemic of measles among soldiers in which bronchopneumonia was a frequent complication. Four of the soldiers died. The vaccine was used effectively as a prophylactic in sixty-two cases. In another group of soldiers in which vaccine was not given several complications developed. It was used in the treatment of twelve soldiers with measles who had developed bronchopneumonia. The vaccine therapy had a favorable effect and caused a rapid fall of the fever, improvement in the general condition of the patient, diminution in the respiratory symptoms (especially the dyspnea) and suppression of complications or of a recurrence of the disease. All the patients recovered. In both groups the treatment was begun with the injection of 0.5 cc. of the vaccine the first day and then 1 cc. daily for three successive days. Untoward effects were not observed.

Siglo Médico, Madrid

84: 85-112 (July 27) 1929

*Complete Congenital Branchiogenous Fistula of Neck. J. M. Barajas y de Vilches.—p. 85.
Influence of Motion Pictures on Nervous Excitability. V. Ribón.—p. 86.

Complete Congenital Branchiogenous Fistula of Neck. —Barajas y de Vilches' patient, aged 13, had a congenital branchiogenous fistula of the neck. The external orifice of the fistula was a small and suppurating sinus at the anterior border of the right sternocleidomastoid muscle. The internal orifice was in the larynx. The patient had some periods of aggravation which ended with the elimination of a large amount of pus. Roentgen examination following the injection of iodized oil showed the fistula to be 11 cm. long. It was resected completely under local anesthesia with a 1 per cent solution of procaine hydrochloride and epinephrine.

Deutsches Archiv für klinische Medizin, Leipzig

164: 257-380 (July) 1929

Physiologic and Pathologic Significance of Cutis Marmorata. R. Mayer-List.—p. 257.
*Bilirubin in Stools, Urine and Blood in Diseases of Liver. A. Adler and B. zu Jeddeloh.—p. 282.
*Transition from Aleukemic Myelosis to Acute Leukemia. P. Müller and G. Spröhnle.—p. 298.
Passage of Water and Ions from Liver to Blood and Lymph in Obstruction of Bile Ducts. K. Beckmann.—p. 309.
*Atrioventricular Double Rhythm. W. Dressler.—p. 326.
Abnormal Bacterial Content of Stomach and Duodenum in Gastro-Intestinal Diseases. F. Seeber.—p. 340.
*Significance of Blood Platelets and Blood Protein in Formation of Thrombi. I. Barta and M. Jakab.—p. 350.
*Lactic Acid Content of Blood in Myasthenia. J. Friesz and E. Mohos. —p. 356.
Functional Test of Islands of Pancreas in Diabetes. F. Depisch and R. Hasenöhrl.—p. 361.
Roentgen Examination of Heart and Blood Vessels in Deformities of Thorax. H. Rösler.—p. 365.

Bilirubin and Its Derivatives in Stools, Urine and Blood in Diseases of Liver and Bile Ducts.—In repeated examinations of more than 500 patients with diseases of the liver and bile ducts, Adler and zu Jeddeloh found that slight disturbances in the liver result in an increased amount of urobilin in the stools; the liver attempts to keep the blood free from bilirubin by increased elimination into the intestine (hypercholia). At this stage the amount of urobilin in the urine is not always increased. In more severe injury of the liver the increased amount of urobilin in the stools is accompanied by an increased amount of urobilin in the urine. Even at this stage the amount of bilirubin in the blood serum is frequently not increased. In marked injury of the liver, bilirubinemia appears. With increasingly severe injury of the liver the bilirubin content of the blood at first increases and the urobilin contents of the urine and stools are high; in the subsequent stages, however, the amounts of urobilin in the urine and stools decrease and bilirubinuria appears. In the stage of retrogression the bilirubin first disappears from the urine, the amounts of urobilin in the urine and stools are increased, and the bilirubin content of the blood is decreased. The authors believe that their observations in so many cases prove that repeated examination of the stools, urine and blood for bilirubin and its derivatives is of value in the differential diagnosis of diseases of the liver and the bile ducts.

Transition from Aleukemic Myelosis to Acute Leukemia.—Müller and Spröhnle report the case of a woman, aged 55, in whom at first only the symptoms of aleukemic myelosis were present but in whom later the additional symptoms of acute leukemia appeared. They state that this case demonstrates that neither the absence of a palpable spleen nor leukopenia excludes the existence of a chronic myeloid leukemia if the qualitative changes of the blood picture in leukemia are present.

Atrioventricular Double Rhythm. — Dressler reports a case of atrioventricular double rhythm in a woman, aged 32, which he believes was caused by an interference between two centers located in the atrioventricular node.

Significance of Blood Platelets and Blood Protein in Formation of Thrombi.—Barta and Jakab state that the agglutination of blood platelets is accelerated by fibrinogen, globulin and albumin. The degree and time of occurrence of the agglutination depend on the concentration of the solution of protein. The agglutination of blood platelets in an isotonic solution of sodium chloride occurs when the hydrogen ion concentration is between 3.5 and 4.5. The agglutination of blood platelets in solutions of protein is most marked and appears earliest at the hydrogen ion concentration at which the tendency of the protein to precipitate is greatest. The authors performed experiments in vitro which showed that of the protein fractions of the blood the fibrinogen, by its action in the agglutination of blood platelets, is of the greatest importance in the formation of thrombi.

Lactic Acid Content of Blood in Myasthenia.—Friesz and Mohos determined the lactic acid content of the blood during rest and after physical exercise in two patients with myasthenia and in three healthy persons. They found that the amount of lactic acid in the blood during rest in the two patients with myasthenia was normal; after physical exercise, however, the increase in the amount of lactic acid in the blood was much greater in the patients with myasthenia than in the healthy persons and in the former the increase was even more marked ten minutes after exercise. The contents of inorganic phosphorus and sugar of the blood were approximately the same after exercise as before but the p_H of the blood was greatly decreased following exercise. The authors believe that the increase in the lactic acid content of the blood following exercise in myasthenia is caused by a disturbance in the

resynthesis of the decomposition products of glycogen in the muscle itself. Myasthenia, therefore, is accompanied by a disturbance in the metabolism of the working muscle.

Deutsche medizinische Wochenschrift, Berlin

55: 1287-1328 (Aug. 2) 1929

Treatment and Cure of Gonorrhea. W. Scholtz.—p. 1287.
*Simultaneous Occurrence of Congenital and Acquired Syphilis in Infants. E. Hoffmann.—p. 1289.
Relation Between Disturbances in Internal Secretion, Angioneurosis and Hypertension. O. Müller and K. A. Bock.—p. 1291.
*Modern Therapy of Rickets with Irradiated Milk or Ergosterol Preparations. E. Wieland.—p. 1296.
*Dietary Treatment of Lupus Vulgaris. S. Bommer and L. Bernhardt. —p. 1298.
Secondary Pharmacologic Actions of Strychnine. R. Hift.—p. 1300.
Roentgen Examination of Isolated Fractures of Bodies of Vertebrae. O. Kingreen.—p. 1302.
Clinical Aspects of Endometriosis in Women. G. Haselhorst.—p. 1304.
Occurrence of Brucella Abortus Infections in Province of Brandenburg. W. Silberstein.—p. 1306.
Special Berkefeld Filter for Filtration of Small Quantities of Fluids. I. Schereschewsky.—p. 1307.
Causes of Sudden Anuria. M. Henkel.—p. 1307.
Generalized Urticaria Following Sting of Wasp. H. Schaefer.—p. 1308.
New Method for Treatment of Chronic Conjunctivitis. M. Maschke. —p. 1309.

Simultaneous Occurrence of Congenital and Acquired Syphilis in Infants.—According to Hoffmann, clinical as well as experimental observations prove that in infants congenital and acquired syphilis may occur simultaneously. An infant who at birth appears healthy but who shortly before birth has been infected by way of the placenta may acquire a superinfection in the form of a cutaneous chancre. The chancre is accompanied by enlargement of the regional lymph nodes and often simulates the primary lesion in acquired syphilis. Whether the spirochetes that enter the organism during the placental infection, or whether the spirochetes that cause the cutaneous infection, will dominate depends on the number of spirochetes that caused the superinfection. The author asserts that the mixed forms of syphilis are comparatively rare. The differential diagnosis in such cases is usually difficult. Nevertheless it is not only of theoretical interest but also of practical value, and it requires the cooperation of gynecologists, dermatologists and pediatricians.

Modern Therapy of Rickets with Irradiated Milk or Ergosterol Preparations.—Wieland discusses the treatment of rickets by means of irradiated milk, milk preparations and irradiated ergosterol. He gives rules for the correct dosage and he directs attention to the harmful effects that result from overdosage. It is also pointed out that this therapy should be employed only in diseases such as rickets, tetany and osteomalacia; in short, only in disturbances that are caused by D avitaminosis. In order to avoid carelessness or the misuse of substances containing the specific D factor, all irradiated preparations should be administered only under the supervision of a physician; to the practitioner, the author gives the following suggestions: 1. Irradiated ergosterol should be prescribed only in diseases that are caused by deficiency in vitamin D. 2. From 2 to 4 mg. of irradiated ergosterol is to be considered the maximal dose, and not more than 0.5 liter of irradiated milk should be given. 3. In cases of rickets that are not complicated by febrile diseases the duration of the specific treatment should not be longer than from eight to ten weeks.

Dietary Treatment of Lupus Vulgaris.—Bommer and Bernhardt point out that the older methods of treatment of lupus vulgaris usually aimed at the destruction of the focus of the disease. However, this local therapy often resulted in disfiguring scars. For this reason it has been more and more abandoned in favor of a general therapy. The main feature of this treatment is the diet, which is based on the rules given by Gerson, Sauerbruch and Herrmannsdorfer. This dietary treatment completely eliminates the use of salt in the preparation of the foods. Fats are given in comparatively large quantities; carbohydrates, however, are restricted. A general irradiation, in the form of sun baths, often adds to the favorable results of the diet. However, local irradiation of the diseased areas is not advisable. Under the influence of this treatment, patients with severe lupus vulgaris gradually recover; the author shows pictures that illustrate the good cosmetic results of this therapy.

Klinische Wochenschrift, Berlin

8: 1433-1480 (July 30) 1929. Partial Index

Digestion and Utilization of Animal Organs in Our Diet. H. von Hoesslin.—p. 1433.
*Changes in Trypanocidal Substances in Serum in Pernicious Anemia. F. Rosenthal.—p. 1436.
Etiology of Postvaccinal Exanthems. O. Gans.—p. 1444.
Elimination of Lactic Acid in Relation to Consumption of Oxygen in Bodily Exertion. K. Gollwitzer-Meier and E. Simonson.—p. 1445.
Influence of Hyperfeminization on Propagation and on Offspring. W. Reiprich.—p. 1449.
Comparison of Investigations with Pulse Resonator and with Electrocardiograph. A. Fürstenberg and E. Hoffstaedt.—p. 1451.
*Treatment of Wounds with Carbon Dioxide. S. Hediger.—p. 1452.
Comparison of Acidity Reactions in Single Evacuation Following Boas' Test Breakfast and in Fractional Evacuation with Retention Catheter. F. Lickint.—p. 1453.
Indirect Reaction of Bilirubin in Mechanical Icterus. L. Hollós.—p. 1455.
Parallelism Between Antirachitic and Arteriotoxic Actions of Irradiated Ergosterol. W. Heubner and F. Holtz.—p. 1456.
Variations in Surrounding Temperature as Causes of Changes in Circulation. H. Rein and R. Rössler.—p. 1457.
Influence of Ultraviolet Rays on Development of Cancer of Skin. S. Rothman and L. Bernhardt.—p. 1458.

Changes in Trypanocidal Substances in Serum in Pernicious Anemia.—Rosenthal points out that in former investigations he found that a relationship exists between trypanocidal bodies in the serum and certain functions of the liver. He then names several authors who studied the changes in the trypanocidal substances in various diseases. Recently Freund and Gassmann noted a reduction in these substances in the serum of patients with pernicious anemia. This circumstance as well as the fact that the liver therapy of pernicious anemia has given rise to many unsolved problems induced the author to make a thorough investigation of the behavior of trypanocidal bodies in the serum of such patients. He made blood tests in ten patients, and, in order to determine the therapeutic effects of the trypanocidal substances, experiments were made on mice. A tabular report shows that the serum of three patients had the normal amount of trypanocidal substances. In three others the amount was slightly reduced, but the four remaining cases showed a marked reduction. Consequently the decrease in the trypanocidal substances in the serum is not a constant serologic symptom of pernicious anemia, but it is nevertheless a frequent attendant phenomenon. Tests on mice that had been infected with trypanosomes revealed that the therapeutic effects of serum from patients with anemia were much reduced compared with that of normal serum. The author also observed that, as soon as the patient's condition improved and the blood picture returned to the normal, the trypanocidal substances likewise increased again. A satisfactory explanation for these changes in the trypanocidal substances in the serum of patients with pernicious anemia has as yet not been found. The author asserts that, in accordance with the present status of our knowledge, it can only be stated that in the serum of patients with pernicious anemia there appear changes which are also characteristic for disturbances of the liver.

Treatment of Wounds with Carbon Dioxide.—Hediger attempted to treat wounds by applying carbon dioxide. The gas is led directly from the tank, through a washing bottle, into a rubber cap that covers the wound. The treatments are given twice a day, each one lasting from one to two hours. When the throttle valve is properly adjusted, about 50 liters of carbon dioxide is required hourly. The effect of the treatment becomes manifest in a hyperemia of the wound area and in a more profuse secretion. After several days the wound becomes clean, granulations appear, and the epithelization starts from the edge. The author asserts that this treatment is especially suitable for slowly healing wounds. So far it has been applied only in a limited number of cases. In all of them the results were favorable.

8: 1481-1520 (Aug. 6) 1929

Influence of Gymnastics on Bodily Development of Child. E. Schlesinger. —p. 1481.
Antibodies in Syphilis. A. Hauptmann and A. Gallinek.—p. 1485.
Inhalation Anesthesia with Rebreathing. T. Fohl and H. Eitel.—p. 1487.
Influence of Bodily Posture on Water Metabolism in Infants. O. Bosch. —p. 1492.
*Latent Tuberculosis of Apex of Lung as Cause of Sudden Fatal Hemoptysis. C. Bäumler.—p. 1493.
Living Vaccine in Treatment of Gonorrhea. E. Langer.—p. 1494.
Bacteriology and Therapeutic Value of Living Gonococcus Vaccine. F. Wolff.—p. 1496.

Diagnosis of Peptic Ulcer: Value of Test Breakfast. T. Bársony. —p. 1497.
*Physiologic Mallein Reaction in Man. H. Brokman and H. Hirszfeld. —p. 1499.
Diuresis as Conditioned Reflex: Observations on Dogs. W. Grossmann. —p. 1500.
Colorimetric Determination of Lactic Acid According to Mendel-Goldscheider. H. J. Fuchs.—p. 1500.
Pathogenesis of Endocarditis. K. Sensroth and R. Koch.—p. 1500.

Latent Tuberculosis of Apex of Lung as Cause of Sudden Fatal Hemoptysis.—Bäumler reviews four cases of latent tuberculosis of the apex of the lung. In all four patients, overexertion led to sudden death. From his observations the author draws the following conclusions: 1. Hemoptysis in otherwise healthy appearing persons always indicates tuberculous processes in the apex of the lung, particularly in the right lung. 2. Patients who are affected in this manner should be warned against excessive bodily exertions such as running, dancing, mountain climbing and strenuous sports.

Physiologic Mallein Reaction in Man.—Brokman and Hirszfeld point out that, with the aid of cutaneous tests, specific relations may be detected between the human organism and certain pathogenic micro-organisms. Such tests are the tuberculin, trichophytin and the mallein reactions. It is generally assumed that the allergic reaction is an individually acquired capability of reaction, which develops following an infection but which is missing in "normal" individuals. However, experiences with other immunity reactions, such as scarlet fever or diphtheria tests, for which the presence or absence of antibodies is essential, prove that they are not always traceable to a specific infection. In some instances the immunity seems to be congenital. Assuming that the conditions are similar in the allergic, cutaneous reactions, that besides the acquired capability for reaction there exists a physiologic one, the authors made tests on 106 children, varying in ages between 1 month and 14 years. In order to eliminate the possibility of allergy that had been acquired as the result of an infection, they performed the mallein test. A tabular report indicates that, following the intracutaneous injection of mallein, positive reactions became manifest in 12.5 per cent of the infants less than 1 year old. The percentage of positive reactions increased with the age of the children. Children aged between 1 and 5 years gave 21 per cent positive reactions, whereas those from 5 to 12 years of age reacted positively in 42.3 per cent of the cases. Because the tuberculin reaction shows the same tendency, experiments were made to determine whether any relation exists between these two reactions. A table giving the results of these tests indicates that the two reactions are entirely independent of each other. The authors conclude that there exists a physiologic mallein reaction in man which varies according to the individual. The trichophytin test and the tuberculin reaction are now being investigated.

Medizinische Klinik, Berlin

25: 1159-1196 (July 26) 1929

Present Status and Future Prospects of Therapy with Infraroentgen Rays. G. Bucky.—p. 1159.
Temporary Sterilization of Female Animals by Feeding with Insulin. E. Vogt.—p. 1163.
*Differential Leukocyte Count in 700 Patients with Pulmonary Tuberculosis. E. Brinkmann.—p. 1164.
Diagnostic Agglutination and Vaccine Therapy with Modified Tubercle Bacillus. E. Allard and Wotzka.—p. 1167. C'en.
*Gangrenous Processes in Pharynx in Agranulocytosis. S. Korach.—p. 1171.
Treatment with Weak Radium Rays. G. Burckhard.—p. 1172.
Hay-Fever in Relation to Exudative Diathesis. W. Kaupe.—p. 1173.
Diseases of Joints in Influenza. A. J. Weil.—p. 1173.
Experiments with Colored Antigen in Meinicke Turbidity Reaction. B. Stepowski and W. Wróblewski.—p. 1174.

Differential Leukocyte Count in Pulmonary Tuberculosis.—Brinkmann made a differential leukocyte count in 700 patients with pulmonary tuberculosis. Each stage of the disease was represented by a large number of cases. The blood was withdrawn when digestion was not in progress. The staining was done according to Giemsa's method or according to one of the modifications of Giemsa's procedure. In many cases the tests were repeated. However, the author asserts that in most instances satisfactory results may be obtained if the test is performed only once. He classifies the hemograms according to the degree of lymphocytosis and according to the degree of deviation to the left. He observed that when lymphopenia and deviation to the left, or a normal number of lymphocytes with marked deviation to the left, are found in patients whose anamnesis indicates tuberculosis or who show other symptoms of tuberculosis, there exists an early infiltrate or some other new tuberculous process. If the physical examination indicates only a minor tuberculous disturbance and if the blood picture is characterized by a marked shifting to the left, a cavity exists probably in parts of the lungs which are less accessible by the physical methods. The degree of deviation to the left parallels the acuity of the tuberculous process. An increase in the number of lymphocytes indicates that the organism has a high power of resistance. The eosinophils probably have the same significance as the lymphocytes. Nothing definite concerning the monocytes is known yet. The author concludes that the differential leukocyte count, probably more than other laboratory methods, is of value in determining the condition of the tuberculous process, as well as in deciding on the best therapeutic methods for the individual case.

Gangrenous Processes in Pharynx in Agranulocytosis.—Korach reports the case of a woman, aged 63, who four times during five months had an attack of follicular angina with high temperature. During the fourth attack, necrosis of the tonsils and gangrene of the tongue developed. The blood picture showed that the granulocytes had almost completely disappeared. This led to the diagnosis of agranulocytosis. Several days later the patient died. The author assumes that disturbances in the granulocytic apparatus probably existed during the first attacks of angina but had not been recognized. He points out that in cases of angina the blood picture and the bacteriologic conditions should receive careful attention.

Münchener medizinische Wochenschrift, Munich

76: 1199-1238 (July 19) 1929

Manifestations, Diagnosis and Treatment of Tuberculosis of Upper Air Passages. J. Beck.—p. 1199.
Influence of Climate of High Altitudes on Early Infiltrate in Tuberculosis. G. Burkhardt and A. Schuberth.—p. 1203.
*Dietary Treatment of Wounds and Inflammations During Puerperium. F. H. Bardenheuer.—p. 1205.
Evaluation of Diphtheria Immunization with T. A. F. (Toxin-Antitoxin Floccules). M. Soldin.—p. 1208.
Frequency of Brucella Abortus Infection in Man. W. Rimpau and K. Steinert.—p. 1209.
*Statistics on Deformities Due to Obstetric Traumas. M. Lange.—p. 1211.
New Vaginal Speculum. G. Espeut.—p. 1214.
Causes and Treatment of Chronic Posterior Parametritis. A. Müller.—p. 1214.
Technic of Reducing Diet. F. Salzmann.—p. 1215.

Dietary Treatment of Wounds and Inflammations During Puerperium.—On the basis of Herrmannsdorfer's demonstration that the nutrition has an influence on the healing of wounds, Bardenheuer applied this dietary treatment in obstetric operations such as cesarean section, forceps operations, perineal sutures and manual removal of the placenta. Moreover, he reasoned that even after spontaneous births the inside of the uterus represents a wound area and, especially in primiparas, the vagina and the perineum often have small tears and scratches. All these wounds heal by second intention. Consequently their healing process is essentially the same as in granulating wounds, and Herrmannsdorfer's dietary treatment should bring the same good results. As permissible constituents of the diet for a puerperal woman the author names meat, fish, eggs, butter, lard, bread, flour, cheese, brussels sprouts, lentils, nuts, cranberries, currants, lemon juice, beer, tart wines, cocoa, tea, coffee, honey and sugar candy; he prohibits sausages, potatoes, fruit, preserves, most salads and vegetables, and sweet milk. The foods should not be boiled too much. Fats are required in comparatively large quantities. Carbohydrates, however, are to be restricted. Salt should be used sparingly and the fluid intake should be limited. This "sour" diet alone has a favorable influence, but in order to increase the good results of the diet the author recommends the daily administration of 5 cc. of a 25 per cent solution of phosphoric acid in a mixture of sugar, water and tart, red wine. It is also pointed out that in patients who have been recently operated on, fasting has often the same good results as the sour diet, because starvation likewise produces acidosis. The author employed the dietary treatment in more than 100 puerperal women. He noted that under the influence of this treatment the lochia ceases sooner and the involution

of the uterus progresses more rapidly. Wounds and inflammations heal better and septic disturbances are checked. The author also points out that the rules of this dietary treatment correspond largely with the regimens for puerperal women which may be found in the literature of obstetricians of two and three centuries ago. The simplicity of the diet as well as of the medication with phosphoric acid permits the general application of this method.

Statistics on Deformities Due to Obstetric Traumas.—Lange investigated the causes of deformities in 5,537 patients who entered the orthopedic clinic in Munich during the years from 1921 to 1928. He found that in 3 per cent of the cases the deformity could be traced to an obstetric trauma. In the majority of these patients the injury was due to forceps operations or to version. In the other cases the anamnesis revealed normal or premature birth. According to the nature of the deformity the author classifies the patients into four groups. He names cerebral spastic diplegia, obstetric paralysis of the arm, results of a badly healed fracture of the femur, and torticollis. He asserts that 50 per cent of these cripples are incurable, and he directs attention to the social and economic significance of this fact. If the conditions in Munich are indicative of the conditions in the whole country, there are in Germany 3,300 juvenile cripples whose deformities are the result of obstetric trauma. How much changes in obstetric surgery can remedy these conditions has to be decided by gynecologists and obstetricians.

Nervenarzt, Berlin

2: 385-448 (July 15) 1929

Pension Neurosis: Medical Aspect of Legal Terms. P. Jossmann.—p. 385.
Psychoanalysis and Religion. H. Seng.—p. 393.
*Metasyphilis of Central Nervous System: Early Recognition and Prevention. E. Hoffmann and A. M. Memmesheimer.—p. 399.
Hallucinations: Critical Analysis of Various Studies. E. Minkowski.—p. 406.

Metasyphilis of Central Nervous System: Early Recognition and Prevention.—Hoffmann and Memmesheimer stress the importance of adequate treatment in early cases of syphilis to prevent later manifestations in the central nervous system. They consider the Bonn method of treatment, in which arsphenamine and bismuth compounds are given in large frequent doses, as effective in recent cases of infection as well as in older cases. As a basis for this statement, the results in 1,000 patients from the records of the Bonn clinic have been made use of, and in addition the results in sixty cases from the private practice of Hoffmann and 115 cases from that of Memmesheimer are reported. When maximal chemotherapy is combined with malarial treatment the results may be still more favorable and metasyphilis may become a curable disease. The complete suppression of syphilis still remains problematic; congenital syphilis, however, can certainly be prevented.

Wiener klinische Wochenschrift, Vienna

42: 985-1012 (July 25) 1929

*Clinical Aspects of Glandular Fever. H. Lehndorff.—p. 985.
Surgical Diseases of Meckel's Diverticulum. A. Winkelbauer.—p. 989.
*Dietary Treatment in Pulmonary Tuberculosis. J. Kretz.—p. 993.
Studies on Behavior of Malaria Parasites in Serum of Same and of Different Blood Groups. L. Horn.—p. 995.
*Ileus Due to Free Silk Ligature. K. Urban.—p. 997.
Supplement to Theory of Formation of Urine According to Bujnewitsch. K. Bujnewitsch.—p. 997.
Physical Therapy in Gastro-Intestinal Diseases. A. Strasser.—p. 998.
Differentiation Between Angina Pectoris and Cardiac Asthma. J. Pal.—p. 1003.

Clinical Aspects of Glandular Fever.—Lehndorff points out that glandular fever was first described about forty years ago by Pfeiffer. In the years following, the conception of this disease became somewhat confused. With the aid of hematology, however, it was possible to establish glandular fever again as a distinct disease entity. The author describes the symptoms and then discusses the characteristics of the blood picture. He states that definite knowledge concerning the etiology and the pathogenesis of glandular fever has not yet been obtained. However, the clinical aspects of the disease as well as its occurrence in several members of one family or in many pupils in the same school indicate that it is an infectious disease. The portal of entry of the unknown micro-organism is probably the oropharyngeal cavity. The present status of knowledge of glandular fever may be thus summed up: It is an infectious disease caused by a micro-organism that has a special affinity for the glandular tissues. The disease has a febrile beginning and is characterized by a generalized swelling of the lymph nodes and enlargement of the spleen. In many cases, angina develops. The blood picture presents a moderate leukocytosis, a decrease in the granular cells and a considerable increase in the nongranular cells.

Dietary Treatment in Pulmonary Tuberculosis According to Sauerbruch, Herrmannsdorfer and Gerson.—Kretz reports his observations on fifty tuberculous patients who underwent the dietary treatment according to Sauerbruch, Herrmannsdorfer and Gerson. He describes the manner in which the dietary treatment was conducted and he asserts that in many cases a considerable increase in weight and an improvement in the general condition was noted. However, a direct influence on the tuberculous process, on the fever or on the amount of sputum did not become manifest.

Ileus Due to Free Silk Ligature.—Urban describes a case of ileus remarkable on account of its unusual etiology. A silk ligature applied in a former gynecologic operation had become loose and projected into the abdominal cavity, and a loop of the small intestine had become incarcerated in it. This caused ileus and gangrene of a segment of the intestine 70 cm. in length. The segment of intestine was resected and the patient recovered.

42: 1013-1040 (Aug. 1) 1929

Dehydration Therapy in Exudative Processes, Especially in Chronic Articular Rheumatism. P. Saxl and O. Erlsbacher.—p. 1013.
Diagnosis and Prognosis in Birth of Thoracopagus. E. Herrmann.—p. 1016.
*Treatment of Melanosarcoma. A. Mülleder.—p. 1019.
*Gastro-Intestinal Disturbances in Pulmonary Tuberculosis. A. Schiff.—p. 1020.
Accidents Due to Traffic and Sport: Statistical Report of the Years 1924 to 1928 of the First Surgical Clinic of the University of Vienna. B. Kaufmann.—p. 1024.
Genital Infantilism in Relation to Sterility. H. Katz.—p. 1030.
Various Forms and Causes of Cerebral Hemorrhages. E. Pollak.—p. 1031.

Treatment of Melanosarcoma.—Mülleder reports the case of a physician, aged 66. Since childhood the patient had had a pigmented mole on the left thigh. At the age of 56 he first noted an ulceration of the mole. In 1921 it was extirpated and the histologic examination revealed a melanosarcoma. In 1924 a growth about the size of a nut was removed from the groin on the left side. This tumor likewise proved to be a melanosarcoma. Several months later, other growths developed in the left inguinal region. The patient refused operation. However, in 1927 the tumors had enlarged and the patient consented to have them removed. In the meantime smaller growths had developed in the right inguinal region. These were removed in the fall of 1928. In each case, histologic examination confirmed the diagnosis: melanosarcoma. At the present time, small tumorous growths are developing again in the inguinal regions. Roentgen examination of all organs and of the bones revealed that the patient is otherwise free from metastases. Extirpation and histologic examination of one of the many nevus-like formations on the skin of the patient proved that they were not of a malignant nature. Although the patient has been suffering from melanosarcoma for eight years, his general condition is comparatively good. The author thinks that this is largely due to the patient's self treatment. He changed his mode of life completely. He abstained from meat and lived mostly on a raw vegetable diet. He also abstained from alcohol and from nicotine. The most significant factor in his treatment was a sun bath, which he took daily for several hours. In order to be able to continue his light therapy all the time, he spent the winters in a southern climate, and on cloudy days he took quartz lamp irradiations lasting from one to one and one-half hours.

Gastro-Intestinal Disturbances in Pulmonary Tuberculosis.—In discussing the gastro-intestinal disturbances in patients with tuberculosis, Schiff differentiates between specific and nonspecific tuberculous conditions. In regard to the first group he states that tuberculosis of the stomach occurs relatively seldom. Intestinal tuberculosis, however, develops in from 60 to 70 per cent of tuberculous patients. Of the nonspecific tuberculous disturbances of the gastro-intestinal tract, the author gives a more detailed description. He discusses three groups of

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disturbances that are most often noted in tuberculous patients; namely, nervous dyspeptic disturbances, pseudo-ulcer and pseudo-appendicitis. The severity of these disturbances does not parallel the pulmonary process. They are often most severe in patients with beginning tuberculosis. Frequently these patients seek the physician's advice on account of their gastric disturbances and are not aware of a beginning tuberculosis. It is therefore of practical importance for the physician to know the clinical aspects of these disturbances and to recognize the tuberculous process that they mask.

Wiener medizinische Wochenschrift, Vienna

79: 985-1012 (July 27) 1929

Clinical Aspects, Prognosis and Treatment in Pneumoperitoneum. J. Schnitzler.—p. 987.
Indications of Fitness for Life in Tropical Regions. R. Stigler.—p. 989.
*Statistics on Carcinoma of Rectum. F. Mandl and W. Pacher.—p. 991.
Prognosis and Treatment of Intracranial Obstetric Injuries. A. Reuss.—p. 994. C'cn.
Treatment of Nutritional Disturbances in Infants. W. Kornfeld.—p. 1001. C'cn.

Carcinoma of Rectum.—Mandl and Pacher review 374 cases of cancer of the rectum that came under their observation during the years from 1920 to 1928. Of the patients who were treated in the period from 1925 to 1928, no definite statement can as yet be made concerning the permanence of the results. Accordingly, the authors give a detailed discussion only of the 253 patients who received treatment in the years from 1920 to 1925. A hereditary factor was detected in forty-seven instances. The fact that 178 of the patients were men shows that carcinoma of the rectum is much more frequent among men than among women. The patients were of various ages. However, the majority were between 50 and 70 years of age. Eleven patients refused operation. With one exception, all of them died within eleven months after they left the clinic. One patient, aged 24, recovered, and it was found that his case had been incorrectly diagnosed. Colostomy was performed in ninety-three cases. In these instances a radical operation was not possible. Only six of these patients lived from two to four years after the operation. The average duration of life following colostomy was fourteen months. The radical sacral operation, according to Hochenegg's method, was performed on 127 patients. The mortality in these operations was 11 per cent. Concerning the permanence of the results, the author states that 31.5 per cent of the patients lived longer than three years and that 27.2 per cent were still free from relapse five years after the operation. Other methods of radical operation that were employed in a limited number of cases were partial excision, Lisfranc's method, laparotomy and the abdominosacral operation. The authors also discuss the frequency of relapses and the continence conditions. They come to the conclusion that Hochenegg's technic of operation for cancer of the rectum is valuable not only because the operative mortality is relatively low but also because it gives comparatively good permanent results.

Zeitschrift für klinische Medizin, Berlin

111: 1-146 (July 18) 1929

Bicarbonate Excretion in Urine. F. Mainzer.—p. 1.
Bicarbonate Excretion in Urine in Healthy Persons. F. Mainzer.—p. 9.
Bicarbonate Excretion in Urine in Patients with Nephritis. F. Mainzer.—p. 16.
Dissociations and Interferences in Partial Heart Block. W. Dressler.—p. 23.
*Liver Function Tests. A. Jezler.—p. 48.
Effect of Ingestion of Carbohydrates on Galactose Tolerance in Patients with Diseases of Liver. J. Bloch and M. Weisz.—p. 71.
Diabetic Coma Complicated by Azotemia and Pregnancy. O. Christensen and J. E. Holst.—p. 88.
*Leukemic Changes in Cancer. A. Sonnenfeld.—p. 108.
Elimination of Phenolsulphonphthalein and Sodium Thiosulphate in Patients with Normal Kidneys. S. A. Holboll.—p. 117.
*Acidosis of Three Years' Duration. H. A. Salvesen.—p. 128.
*Prevention of Tetany in Hyperventilation. C. Mandowsky.—p. 135.

Value of Various Liver Function Tests.—According to Jezler, a qualitative diazo test with blood is of greater diagnostic value if it is combined with a quantitative determination of the bilirubin. A positive direct reaction indicates injury of the parenchyma of the liver if the bilirubin value does not exceed from 4 to 5 mg. per hundred cubic centimeters. The bilirubin tolerance test of von Bergmann and Eilbott is a sensitive test for diffuse injury of the parenchyma of the liver. Chromodiagnosis with tetrachlorphenolphthalein is not an improvement over the other methods; it is not of value in the differential diagnosis, and the storage and excretion of the dye is not a reliable index of the functioning of the liver. Moreover, the tetrachlorphenolphthalein test is dangerous and should not be used clinically. Even in cases in which the bilirubin tests are inadequate the galactose test differentiates between parenchymatous and mechanical injury of the liver. The simultaneous determination of the blood sugar curve facilitates the diagnosis in cases of disturbed diuresis. In all cases of cirrhosis of the liver with marked decompensation and with unfavorable diagnosis, Takata's flocculation test gives positive reactions.

Leukemic Changes in Cancer.—Sonnenfeld reports two cases of cancer with marked leukemic changes. In a man, aged 61, with primary cancer of the liver the leukocyte count was found to be 104,000; postmortem examination revealed signs of marked activity of the bone marrow and the absence of bone metastases. In another man, aged 60, with primary cancer of the stomach, the leukocyte count was found to be 125,000; postmortem examination revealed myeloid transformation of the bone marrow and myeloid infiltration of the liver, spleen and carcinomatous tissue in the stomach, and the absence of bone metastases.

Acidosis of Three Years' Duration.—Salvesen reports a case of chronic suppurative bursitis with amyloid contracted kidney in a woman, aged 53, in whom he observed an uncompensated acidosis with a hydrogen ion concentration of as low as 7.14 for almost three years. The acidosis resulted from an alkali deficiency of the serum associated with a high chlorine content and marked increase in phosphoric acid. The characteristic clinical symptoms of acidosis did not appear until shortly before death; the organic acids of the serum then increased rapidly and the patient's respiration became forced.

Prevention of Tetany in Hyperventilation.—On the basis of the fact that hypoglycemia is present in the tetany that occurs in hyperventilation, Mandowsky used dextrose in the treatment of this condition. He states that in hyperventilation tetany can be prevented by the peroral administration of sufficiently large amounts of dextrose.

Zentralblatt für Chirurgie, Leipzig

56: 1921-1984 (Aug. 3) 1929

*Operations Without Ligation of Vessels. K. Mermingas.—p. 1922.
Implantation of Fibula into Large Defects of Tibia. A. Mulleder.—p. 1924.
Carbuncle of Kidney. H. Köhler.—p. 1927.
Duplicate Roentgenogram with One Exposure. F. Lemperg.—p. 1933.
Inward Luxation of Ulna. H. Homma.—p. 1938.
Experimental Study of Emptying of Gallbladder. W. Potapow.—p. 1939.

Operations Without Ligation of Vessels.—Mermingas stresses the importance of careful dissection of the tissues in surgical operations, to prevent bleeding. He avoids unrestrained cutting into the tissues. The elastic tissue should be stretched and the vessels thrust aside or, if they run across the operative field, they should be carefully isolated and when large they should be ligated. In mamma amputation he points further to the hemostatic action of the muscular tissue and the pressure caused by the sutured skin.

Zentralblatt für Gynäkologie, Leipzig

53: 1937-2000 (Aug. 3) 1929

Significance of Looseness of Pelvic Joints in Pregnancy. H. Martius.—p. 1938.
Mineral Content of Uterine Tubes. F. Kok.—p. 1944.
*Tetanus Following Wertheim Operation. E. Haeusermann.—p. 1948.
*Anesthesia of Pudendal Nerve. M. Gutman and V. Metz.—p. 1952.
Surgical Treatment of Inflammation of Uterine Adnexa. C. Bucura.—p. 1956.
Late Changes Following Hysterectomy Without Ovariectomy. B. Aschner.—p. 1959.
Abdominal Tumor of Unclear Nature. P. Samson.—p. 1965.
Indications for Cesarean Section in Transverse Positions. E. Sedlis.—p. 1967.
*Toxicity of Blood in Eclampsia. P. Hüssy.—p. 1969.

Tetanus Following Wertheim Operation.—Haeusermann reports four cases in which tetanus developed following extirpation of the uterus according to Wertheim's method. In each of the cases an exogenous infection was excluded. The author believes that the infection occurred from the intestine. In all of the cases, postoperative complications developed. For the

prevention of tetanus following the Wertheim operation, a protective dose of tetanus antitoxin is suggested in all cases in which complications develop; for the treatment of the condition, intraspinal and intramuscular administrations of large doses of serum are recommended.

Indications for Anesthesia of Pudendal Nerve in Obstetrics.—According to Gutman and Metz, anesthesia of the pudendal nerve is the anesthesia of choice in the stage of expulsion in spontaneous labors. They also recommend it in high applications of forceps and in suture of the perineum. The procedure is simple from the technical standpoint and does not necessitate an assistant. In obstetric operations in the home it is more practical than scopolamine-morphine anesthesia, rectal anesthesia and nitrogen monoxide narcosis.

Toxicity of Blood in Eclampsia.—In biologic experiments with plant seeds, Hüssy demonstrated the toxicity of the blood in eclampsia. He mixed cress seeds with blood from a patient with eclampsia and let the mixture stand from twelve to twenty-four hours. He then planted the seeds and at the same time planted control seeds. He noted that the growth of the seeds that had been mixed with blood or blood serum from a patient with eclampsia was markedly inhibited or even suppressed. Control experiments with normal serum, with serum from a normal pregnant woman and with serum from a pregnant woman with slight hyperemesis or nephropathy always gave negative results. Blood from patients with preeclampsia, on the contrary, frequently produced marked retardation of growth.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

73: 2345-2440 (May 18) 1929

An Ordinary Case of Sickness. W. Nolen.—p. 2346.
*Para-Arterial Neurotomy, a Modification of Periarterial Sympathectomy by the Leriche Method. R. Brummelkamp.—p. 2359.
Treatment of Ischias and Neuralgias with Strong Galvanic Current. E. Roselaar.—p. 2374.
A Case of Koilonychia. A. G. J. Hermans.—p. 2377.

Para-Arterial Neurotomy.—Brummelkamp brings out that para-arterial neurotomy offers the same advantages as sympathectomy by the Leriche method, and lacks the dangers of sympathectomy.

Hygiea, Stockholm

91: 497-528 (July 15) 1929

*Rapid Changes in Suspension Stability of Blood. J. Möllerström.—p. 497.

Rapid Changes in Suspension Stability of Blood.—Möllerström found that these variations, first noted by Rhodin, in scarlet fever, appear from day to day, sometimes from hour to hour, in certain cases in various infectious disorders and in more chronic conditions. Judgment based on only a stability reaction may thus be misleading. The rapid changes in the suspension stability of the blood seem to him hardly to be explained by the increase in globulin due to cell destruction; an unknown factor of more variable nature is believed to be active.

Norsk Magasin for Lægevidenskapen, Oslo

90: 813-940 (Aug.) 1929

*Pathologico-Anatomic Study of Acute and Chronic Gastritis. B. Dahl.—p. 813.
*Observations Regarding Bacteriophage and Bacteriophage Therapy. J. A. Voss.—p. 853.
Management of Labor in Narrow Pelvis. G. Schaanning.—p. 878.
Stieda's Lesion. C. K. Schaanning.—p. 898.
Nutrition and Dental Caries. H. Isaachsen.—p. 903.
*Roentgen Examination of Lungs, Compared with Results of Necropsy and Clinical Examination. T. Dale.—p. 909.

Pathologico-Anatomic Study of Acute and Chronic Gastritis.—Dahl's material comprises specimens from ninety-five stomachs. In twenty-seven cases of gastric ulcer, twelve of duodenal ulcer, and five of cicatrix after chronic ulcer, there was chronic gastritis of the antrum, with acute gastritis in sixteen. All the ulcers had developed in the pyloric region. In twenty-four patients operated on with the diagnosis of ulcer but found to be without ulcer or cicatrix, marked chronic gastritis of the antrum was seen. The nine cases of acute gastritis in this group showed a definite parallelism between intensity and extent of the acute inflammation and intensity of the symptoms; three instances are reported in which an acute exacerbation of the chronic gastritis gave peritoneal symptoms leading to a diagnosis of perforated ulcer, also one case of abortive phlegmonous gastritis. He says that a recurrence of dyspepsia after gastro-enterostomy may be due to an exacerbation of the inflammation or to an acute gastrojejunitis. Fourteen patients with cancer of the lesser curvature were examined. The gastritis with cancer differs from that with ulcer in fibrous change in the stroma and marked changes in the epithelium. Chronic gastritis is believed to be the basis on which the cancer develops. Extensive hyperplastic atrophic gastritis, especially polypous gastritis, is a true precarcinomatous condition. Three cases are described of chronic diffuse gastritis of the antrum presenting all the transition stages from benign simple epithelial hyperplasia to beginning carcinoma.

Bacteriophage and Bacteriophage Therapy.—Twenty-eight patients with cystopyelitis, almost all chronic, given bacteriophage treatment, were controlled by Voss. Of these, sixteen have become sterile. Cystopyelitis of from fifteen to twenty-five years' duration has been without symptoms for five years. In some cases of pyelitis in pregnancy the urine has been made sterile. Cystopyelitis in men does not readily yield to the treatment.

Roentgen Examination of Lungs, Compared with Results of Necropsy and Clinical Examination.—Roentgen examination made in Dale's thirty-five cases from two to three hours after death revealed pathologico-anatomic changes in the lungs or pleura in twenty-three cases. Twelve cases are described. Pathologic changes in the apex and miliary tuberculosis were not established clinically, but the roentgenogram, except in one of the two cases of miliary tuberculosis, showed the characteristic changes of these conditions found at necropsy. Two cases of cavern and one of pulmonary abscess found at necropsy were not diagnosed from the roentgenogram.

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Ugeskrift for Læger, Copenhagen

91: 643-664 (Aug. 1) 1929

Symptomatology of Tumors of Brain. V. Christiansen.—p. 643.
Perforated Gastric Ulcer in Two Youths. E. Holm.—p. 649.
*Investigations on Virulence of B C G. K. A. Jensen, J. R. Mørch and J. Orskov.—p. 650.

Investigations on Virulence of B C G.—The investigations of Jensen et al. were made with a strain of B C G cultivated for two years according to the method of Calmette and Guérin. In no case have they observed a sign of increased virulence, either originating spontaneously during cultivation or during the stay of the B C G in the animal organism.

91: 665-686 (Aug. 8) 1929

*Surgical Treatment of Tumors of Brain. V. Christiansen.—p. 665.
*Frequency of Syphilis Among 5,158 Medical Patients. J. A. Jørgensen.—p. 671.
Seeing One's Own Cataract. O. Blegvad.—p. 674.
Some Methods of Bandaging. H. Tvedegaard.—p. 679.

Surgical Treatment of Tumors of Brain.—In general, Christiansen attempts extirpation of brain tumors if the focal symptoms allow definite diagnosis of the seat of the tumor and the technical difficulties do not bar radical operation. This procedure is always used in cerebral tumors with extracerebral localization. In case of intracerebral tumors diagnosed as to location, craniotomy is done as a simple decompressive trepanation, without an attempt at extirpation; only if the tumor is cortical, or if puncture discloses a cystic tumor, or if, when the dura is opened, a subcortical tumor ruptures the brain tissue over it, is more or less complete removal attempted. He emphasizes that decompressive trepanation is purely a therapeutic intervention. If in tumors localized in the cerebellopontile angle digital exploration after puncture of the lateral ventricles shows total extirpation to be possible, the intervention is done. In three or four of his cases this method gave complete and permanent recovery. When radical operation is impossible, either partial extirpation is done or the occipital craniotomy is allowed to serve as a simple decompressive trepanation. Excellent results were obtained by the latter treatment in several cases.

Frequency of Syphilis.—Jørgensen found that 452, or 8.8 per cent of 5,158 patients, were syphilitic. He regards this number as a minimum figure. Systematic Wassermann examination in all hospitals is urged.